Food Manufacture

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Bread Consumption.

IT IS very difficult to arrive at correct conclusions on this interesting subject as authentic statistics are not easy to obtain. Still, all the information that comes to hand relative to the consumption of food per head leads to the view that people are eating less bread than formerly. The U.S. Bureau of Foreign and Domestic Commerce has issued an official statement to the effect that in 1899 the inhabitants of the United States used 223·9 lbs. of wheat flour per head, whereas in the period 1923-1927 the average annual consumption was only 177·1 lbs. per head. There is also a similar downward tendency in the consumption of rye flour—roughly from 7 lbs. per head in 1889 to 3 lbs per head in 1925. The fall in consumption of wheat flour has been accompanied by an increase in other food products, such as sugar, breakfast foods, and dairy products. It seems evident that there is always a tendency for people to pass from a restricted vegetable and cereal diet to one more varied whenever improved economic conditions increase the family exchequer. It is probably the increased palatability of meats and high protein foods that is the cause of this dietary change. It is still true that man cannot live by bread alone. The body requires a judicious combination of foods having a proper balance between starches, fats, and proteins mainly. If this balance is so adjusted that there is neither gain nor loss in body weight, the best conditions exist for the correct functioning of the body. The balance of foods, however, depends to some extent on the physical demands of the body. Those who perform the most exhausting manual labour are the greatest bread eaters, and the consumption of bread per head has sometimes been taken as an index of industrial activity. Looking at the matter from the purely nutritional point of view, bread and milk form as nearly a complete ration as it is possible for two foods to be.

Olive Oil and Ultra-Violet Light.

As we pointed out in the Editorial Comments in the December issue, much attention has been focussed in recent years on the examination of foodstuffs in ultra-violet light. There we referred to the work of Glantz on the fluorescence of olive oil under ultra-violet light, in which a claim was made that as little as 5 per cent. of refined oil in a virgin oil could be detected. It is interesting to note that E. R. Bolton, the well-known English authority on oils and fats, in a note to the *Analyst* (December, 1930), points out that while the observations of Glantz are substantially correct, unfortunately the use of the ultra-violet lamp has proved in practice to lead to inaccurate conclusions. In the first place it is pointed out that a number of oils used for the adulteration of olive oil, notably tea seed oil, may give a similar fluorescence to virgin olive oil. In the second place certain modern methods of refining include treatment that can remove from the refined oils the particular characteristics referred to in Glantz's paper, and the presence of refined oils is therefore not detected. Hence, while one is left with observations that are interesting from the scientific point of view, they have very little diagnostic value, and no analyst can assert with any certainty either that an olive oil is a virgin oil or that it is free from refined or foreign oils as a result of observations under ultra-violet light.

Food Poisoning.

It is interesting to note from the last Annual Report of the Chief Medical Officer of Health that outbreaks of illness ascribed to food poisoning are becoming less common. In some cases where food poisoning has been suspected the real cause has been proved to be bacillary dysentery caused by *B. dysenteriæ* (Flexner). Such types of food poisoning

known (for want of a better term) as the toxin type, which are associated with canned or cooked food in which no living bacteria are found, are now very rare. In the period covered by the report only three such outbreaks could be reasonably ascribed to this form of food, and in all three cases canned veal from a Dutch factory was suspected. One outbreak due to *B. aertrycke* in ice-cream affected twenty-four persons, all of whom recovered. Enquiry indicated that one of those preparing the ice-cream was suffering from a mild attack of gastro-enteritis and was probably excreting the specific bacilli, which may have been contributory to the outbreak. The gradual elimination of food poisoning, which formerly was quite prevalent, is indicative of the progress made in food manufacture and handling.

Antimony Poisoning.

In spite of previous outbreaks of antimony poisoning due to containers for preparing lemonade the trouble still persists. The outbreak in Newcastle-on-Tyne caused by preparing lemonade in enamelled buckets has been followed by a similar one in Folkestone. In the latter case the enamel coating of the jugs used contained about 9 per cent. of antimony oxide in a form readily dissolved by weak acids. The enamel disintegrates rapidly in the presence of weak acids and the antimony is dissolved. Food manufacturers should satisfy themselves that any vessels used for the preparation or storage of food or drink are properly glazed with an insoluble and non-injurious enamel. The onus is more on the food manufacturer who uses them than on the maker of the vessels, unless the former has obtained an absolute guarantee that the enamel ware contains no poisonous material. Vessels made of certain of the synthetic resins may prove very useful in this connection, if glass or glass enamelled ware is impracticable. For weak acid preparations aluminium ware is superior to enamel. The resistance of alloys containing upwards of 30 per cent. nickel to fruit and food acids is also worthy of notice when designing plant for food factories.

Viscogen in Cream.

Viscogen (calcium saccharate) when added to cream has a definite thickening influence. As calcium is normally present in cream, and as the addition of cane sugar to cream is legal, the detection of the addition of viscogen to cream offers considerable difficulties. The analysis of the ash does not provide very satisfactory evidence, because the amounts of lime in the form of viscogen, which are capable of thickening cream, need not exceed 0·04 per cent. of calcium oxide, and, therefore, may not bring the calcium content of the ash appreciably beyond the values sometimes found in normal samples. Viscogen is strongly alkaline, and, if it has been added, the cream will have a low acidity and an increased *p*H value. For the latter determination, brom phenol blue is a suitable indicator, as in fresh unadulterated cream it takes on a yellow coloration, but in presence of viscogen the colour passes through a yellowish-green to greenish-blue or even blue. It is obvious, however, that if the cream has undergone slight subsequent acidification, say, through natural souring, *p*H determinations may give no information. Recent work by Pyne (*Analyst*, December, 1930, p. 747) indicates that tests based on the physical and chemical changes viscogen produces in cream would be more useful than ash or *p*H determinations. Viscogen owes its thickening properties largely to the interaction of its lime with the soluble milk phosphates, whereby a gelatinous precipitate of tricalcic phosphate is formed which carries with it some casein. Pyne has shown that the thickening action of viscogen can be reversed by the addition of a soluble oxalate (the gelatinous calcium phosphate being converted into crystalline calcium oxalate, and the casein being redissolved as alkali caseinate). Hence he suggests a means of examining a sample of cream suspected to contain viscogen by comparing the viscosities before and after addition of potassium oxalate.

This is a very ingenious suggestion, and doubtless the test will give very useful information when carried out under strictly uniform conditions, but most chemists who have worked on viscosimetric methods are well aware of the pitfalls and the completely misleading conclusions which are sometimes drawn from such methods. Moreover, as the author points out, the method only demonstrates the thickening produced by, and not the presence of, viscogen. If the natural cream has a very low phosphate content viscogen may have no thickening power at all. Still, it is possibly the most useful method at present available.

Non-Fattening Sugar.

Another is added to the number of useful products that can be made from the wastes of the cotton fields. The extraction of xylose is announced by Dr. Schreiber. This is a non-fattening sugar and is being produced on a small commercial scale already; it is expected that the production will eventually use up the 1½ million tons of waste cotton seed hull bran that are turned out annually from the cotton mills. The investigation began two years ago when the price of xylose, a 5-carbon sugar, was £20 per lb. in spite of the fact that xylan, the condensation product from which it is obtained, is, next to cellulose and lignin, the commonest organic compound in nature. Koch obtained xylan from wood, grains, straws, gums, husks, stems, etc., as far back as 1886, but little

interest was taken in xylose until the Great War aroused new demands for acetic acid which has been made from it by means of appropriate ferments. Cotton seed hull bran, which contains 30-35 per cent. of pentose—more than any other vegetable substance—is collected from the mills after the requirements of the rayon manufacturers have been satisfied. Hitherto it has been purely a waste product except for some used for meal and cattle cake. The bran is washed in hot water under 15 lb. pressure, treated with cold dilute sulphuric acid, extracted, neutralised with lime, concentrated in vacuo, crystallised, separated by centrifugal, and is then ready for sale; the cost of production is about 2½d. per lb. The by-products are gums, potassium salts and well-washed cellulose.

Ice-Cream Technology.

The forewarming temperature greatly affects the stability of concentrated milks to heat. Experiments are being carried out to determine whether there is an optimum temperature of forewarming for dry skim milk that is to be used in ice-cream. One set of data seems to show that ice-cream containing dry skim, made from skim milk forewarmed at 83° C., is of better quality than ice-cream containing powdered milk previously subjected to other forewarming temperatures.

Steps in Manufacture.

It is customary to combine the ingredients of the mix and then to pasteurise for about thirty minutes at 63° C. (states Leighton). The mix is homogenised or viscolised while hot. It is then allowed to age or ripen by being held at a temperature slightly above freezing for a few hours to a day. In the freezer not more than half the water in the mix is usually frozen, while air is being beaten into the mass. Zoller's measurements gave about 20 per cent. of ice as the mass is drawn from the freezer. Data given by Leighton (*J. Dairy Sci.*, 1927, 10, p. 300), based upon the measurements of actual freezing temperatures made upon concentrated ice-cream mixes, indicate that it is a more common practice to draw the mix when about half the water is frozen.

After the ice-cream is drawn from the freezer, the freezing is finished in the hardening room at a temperature which is at least 17° C. below zero.

Freezing Temperature.

Ice starts to separate at from 2° to 3° C., the temperature depending mostly upon the amount of sugar and milk salts present—the milk fat and protein exerting a negligible effect. The mix cannot freeze completely until the eutectic for cane sugar is reached at about 12° C. Although Dahlberg (*New York Agr. Expt. Sta., Tech. Bull.*, 111, 1925) has shown that the presence of sugar actually improves the texture of ice-cream by decreasing the amount of ice that is formed, excess sugar should be avoided, as mixtures of too low freezing temperature are more unstable when removed from refrigerating atmospheres, and it is more difficult to freeze such mixtures. An excess of milk solids not fat should be avoided also, because excess milk sugar may separate, producing "sandy" ice-cream.

The unfrozen portion of ice-cream is always highly supersaturated to lactose. A study of the solubility relationship of lactose (Leighton and Peter, *Proc. World's Dairy Congress*, Vol. I., p. 477, 1923) shows that in supersaturated solution it exhibits an extensive labile area in which crystallisation is not easily initiated. This probably explains why all ice-cream is not sandy.

Pasteurisation.

Although 63° C. is the usual temperature of pasteurisation, Hening (*Ice-Cream Trade J.*, No. 10, p. 53, 1928) has shown that a temperature 10° higher may be used without markedly affecting the quality of the finished product. A temperature 20° higher gave a cooked taste to the ice-cream.

Homogenisation.

More study should be given to the question of surface equilibrium. The viscosity of the mix is increased by homogenisation, usually in proportion to the pressure used, whilst high temperatures usually lower viscosity.

Dahlberg has shown that the effect of homogenisation upon the texture of ice-cream is dependent upon the presence of milk fat and solids not fat. The process reduces the percentage of gelatin required to form a gel in ice-cream mixtures. Also, homogenisation reduces the size of the air cells by about half, although no direct relation between texture and the size of these cells can be shown.

Ageing.

This process involves cooling the mix to a temperature slightly above freezing and holding it there for at least a day. The product whips more rapidly, and is of a finer texture than the unaged mix. Various theories have been put forward to unravel the mechanism of ageing (see *J. Phys. Chem.*, 1927, p. 596, and 1929, p. 1489; *Ice-Cream J.*, 1929, No. 7, p 41; *Ind. Eng. Chem.*, 1928, p. 516). Sommer has recently pointed out that ageing is apparently intimately connected with the surface phenomena and equilibria of the proteins and fat particles. It would

appear that the ageing process simply allows time for the equilibrium of the fat and protein particles with the surrounding medium to become established. The exact nature of this equilibrium is yet to be determined. Much information will probably be gained by studying ageing from the angle of surface equilibrium.

Whipping.

The interfacial relationship of ice-cream mixes have yet to be investigated, but it is evident that stabilisation of the whipped mass can come from two possible factors: either the small ice particles go into the interface of the air bubbles or the foam is stabilised by the increase of protein-fat concentration due to the separation of the ice. Work needs to be done on these relationships.

Freezer Design.

Leighton suggests that there is a field for research in freezer design. Work on emulsification has shown that each combination of materials seems to require for the best emulsification a specific speed and time of beating, and that the size and shape of the container are factors in determining this optimum speed and time. This suggests the construction of freezers of various types for different mixes. With the present freezers the ice-cream maker's skill lies in his ability to recognise when the best whipping conditions are attained and when the ice-cream is at the best stage for drawing.

Hard Candies in Maracaibo.

The Maracaibo district in the western part of Venezuela, with a population of about 850,000 and five principal cities ranging from 12,000 to 85,000 in population, occupies about 10 per cent. of the total area of the country. The city of Maracaibo is the port of entry for the entire hinterland and the State of Santander del Norte in Colombia.

According to local importers, the demand for hard candies is good considering the population, which is about 3 per cent. pure white, the remainder being of mixtures of white, negro, and Indian. Some of the clubs of the oil companies make occasional requisitions for supplies of hard and soft candies, and no difficulty is apparent in disposing of large quantities in the interior regions. It appears that no efforts are made to keep an adequate stock of candy on hand, and it may be possible for exporters to communicate with the managers of these clubs through the head offices of the oil companies. A fair demand for hard candies in this district prevailed during the first three quarters of 1929, but a decline was noted in the latter part of the year, and continues during this year. No statistics are available to show the imports of confectionery in this district, but it is estimated that about 90 per cent. comes from the United States and the remainder from the United Kingdom and Holland.

Canada.

In proportion to her population, Canada is the largest Empire producer. The production of canned fruits is maintained, and there is a steady growth in shipments to this country. Canadian pears in syrup and gallon apples in water are improving in quality and popularity. Canned vegetables are not shipped in large quantities. As regards salmon, regulations have been introduced with the object of increasing the supply of fish. Also, the amalgamations among the principal canning interests which have taken place should lead to more economic production. Australia and France have now become important markets as an outcome of the preferential tariff which they accord to Canada. Better co-operation between packers and distributors should overcome the popular prejudice against pink salmon. This is a cheap and palatable fish, and there is no reason why it should not be esteemed as highly as the sockeye red salmon, which became a luxury article on account of its scarcity.

Foundation of the Industry.

It comes somewhat as a surprise to read that the sardine canning industry of Canada began as long ago as the 1860's; tinned lobsters were sold in 1870 and salmon six years later. These historical notes are mentioned in the recently issued report of the Bureau of Statistics at Ottawa, which gives figures showing how important the canning industry is at the present time. There are some 658 canneries of all kinds having a total capitalisation of 46·2 million dollars, marketing products to the value of nearly 53 million dollars. The 29 milk factories employ 846 people and the output is valued at $14,161,306. The total productions in other branches of the trade are: Fish, $18,380,344; fruits, $3,283,873; vegetables, $13,699,881; meats, $947,225; syrups, $1,013,026; miscellaneous, $1,753,913. One of the great selling points with regard to Canadian canned food products is the fact that the quality is maintained at its constant high level by the frequent inspection of all the factories by the officials of the Dominion Department of Agriculture under the authority of the Meat and Canned Foods Act; this ensures the goods being clean and wholesome.

Aluminium.

C. Massatsch and H. Steudel consider that aluminium may be necessary for the maintenance of life, since it occurs in almost all animals and plants. The amount of aluminium likely to occur in foods is quite harmless (*Biochem. Z.*, 1930, vol. 220, p. 239).

Closures for Glass Containers

An examination of the principles of container sealing, with a description of some typical modern closures and the duties for which they are suitable.

SO MUCH is expected of modern container closures that it is not surprising that the manufacture of them has become a specialised branch of industry. The closure must provide a perfect seal without demanding too much in the way of accurate finish from the container and yet be readily removable and, often as well, be capable of use as a reseal. It must withstand processing temperatures and pressures, be proof against corrosion by the container's contents, and, above all, add as little as possible to the cost of production.

To the credit of modern industry it must be said that there is not one but many types of closure available which fulfil the above requirements. So many are these, indeed, that the choice of one from among them presents some difficulty, and it is the purpose of this article to discuss the principles of modern sealing methods and thus to assist selection.

There are only a few materials used for the construction of closures, for the metal must be easily worked and not subject to corrosion. It is probably only natural that tinplate would be easily fashioned into a closure for the glass container, since it had met with success in the tin can, particularly after the development of protective coatings.

Aluminium is used as a complete cap, but,* because of its malleability, a counterbalanced air pressure must be used for food processed at high temperatures. In order to make a closure that would have the durability of the tin cap and some of the advantages of aluminium, a two-piece cap has been designed composed of a tinplate disc and an aluminium shell, which is torn off by means of a tab; the tin disc is then pried off. Looking at it from an appearance standpoint under adverse climatic conditions, the aluminium should retain its original condition longer than tinplate.

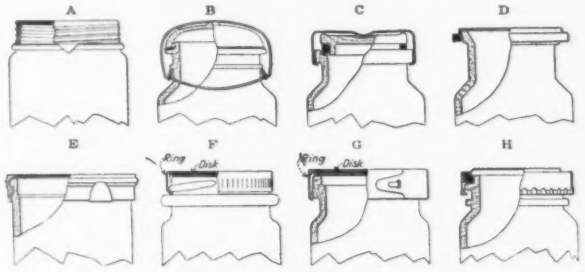
Glass closures are of two types—those which are held in place by iron clamps, and those in which the cap is sealed either by a mechanical vacuum or the vacuum which develops as the product cools. The all glass container requires a heavy rubber ring as a liner.

Sheet Metal Closures.

Practically all metal caps are lacquered on both sides as a protection from rust or action of the product. In instances where no liner is employed, as in the side-seal or top-seal closures, employing only a rubber, composition rubber, or composition cork gasket, the lacquer serves as the protective coating for the closure. When no liner is used a special lacquer is generally employed. This procedure is important with substances that have a corrosive action on the metal, for, once the plate is broken, the cap becomes badly rusted, due to action on the exposed iron. In those cases where greater protection than can be furnished by vegetable lacquers is desired, an enamel is employed.

A series of sketches is shown herewith, giving details of finish, liner, gasket, and cap of several closures. This selection illustrates most of the general characteristics of closures, and will serve to show the major principles of sealing operations.

Sketch A shows the "Mason" jar. Here is a simple principle of a screw thread forcing the rim of the metal cap against the rubber ring just below the thread. The resilience of the rubber ring and the force with which the cap is turned down against the rubber gasket determine the tightness of the seal. If the contents of the container are hot, the cooling action produces a partial vacuum within the container. The finish of this jar is a screw thread



Typical Closures for Glass Containers.

with a horizontal ridge or ring at the base of the threads to support the rubber. The actual seal occurs at the rubber ring.

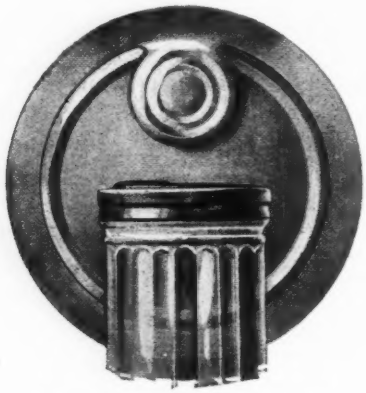
The glass-top jar, B, has, in place of a screw thread, a wire clasp serving to force the top against the rubber ring. The clasp is in two sections—the wire which loops over the top, and the clamp to which this wire is attached. By forcing the clamp down, the loop is pulled tight over the top. This sealing operation is generally performed while the contents are hot, thus obtaining a vacuum seal.

Another type of glass top is shown in sketch C. The finish has a sloping sealing edge inside the neck. The top is flat, with a circular ring on the bottom, which holds the rubber ring or gasket in place against the sloping finish. A spring clamp making contact at the top centre of the cap and the ends hooking below the extension of the rim holds the cap in place. Internal pressure created by heating the container or reducing the external pressure in a vacuum chamber lifts the cap against the spring to permit the escape of air or liquid if the filling level is too high. When the internal pressure drops below the external pressure upon cooling or release of the external vacuum, the spring exerts sufficient force to effect a seal and prevent entrance of air. This valvelike action permits the escape of air but prevents its entrance.

* S. H. Ayers, *Food Industries*, January, 1930.

The three closures mentioned represent fundamental principles of closure operation. In the first two, whether there be vacuum or not, the seal is effective provided the screw cap or wire clamp exerts sufficient force to maintain it. The third closure is strictly a vacuum seal. Unless there is a vacuum inside the container the cover is only lightly held in place by the clamp. When internal vacuum exists, the top is firmly held in place by atmospheric pressure. Releasing the vacuum releases the seal.

One type of metal closure which embodies unique methods of seal is shown in sketch D. This is a one-piece cap formed of lacquered metal. A heavy



The Aluminium "Goldy" Seal.

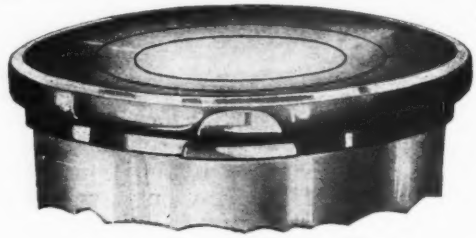
vulcanised rubber gasket is fitted into the skirt of the cap. The seal is effected by a mechanical crimping of the skirt to force the rubber gasket tight against the glass. The seal may be applied with or without a vacuum.

An entirely different type of cap is illustrated in sketch E. This cap is manufactured of lacquered aluminium sufficiently light weight to permit easy tearing. A rubber gasket is located inside the cap against the skirt. No mechanical action is required to effect the seal other than forcing the closure over the top of the jar. This cap is usually employed as a vacuum seal. Because of the light aluminium employed, the cap is bowed inward by the vacuum, tightening the seal. A special finish shown in the sketch is employed for this class, although it may be used against a smooth surface.

Sketch F illustrates the two-piece screw cap. A lug ring is shown, but a continuous thread finish may be employed if desired without changing the sealing efficiency in any way if applied under vacuum. A rubber gasket of the type required for the product is secured to the lower side of the disc. Screwing the ring in place forces the disc against the glass. In vacuum practice the disc is forced in place by head pressure on the disc after the vacuum has been applied to the chamber. This head pressure is maintained until the chamber vacuum has been released. The outer ring serves to protect the disc and gasket from any force which might break the seal.

Another two-piece cap employs a band with a clip to permit easy removal of the band. Sketch G shows this type of cap. The gasket or liner is secured to the disc. The band is a separate piece. This closure can be applied to a hot package or under a vacuum. Rollers turn the lower edge of the band under the finish, thus securely fixing it in position.

A modification of the crown, utilising the crown mechanical seal, but possessing a gasket which is forced into a right-angle ledge on the outside of the neck, is shown in sketch H. The gasket is forced against the horizontal and vertical surface, and the



The "Hazel" Tear-off Seal.

skirt, which is somewhat longer than on the standard crown, is forced around the ring. A vacuum or non-vacuum seal may be employed.

The types shown in the above sketch, which is reproduced from the previously mentioned author's article in *Food Industries*, illustrate general types rather than specific examples, but readers will probably recognise in them the essential features of most of the closures now on the market.

Specific Types.

One well-known closure is the "Goldy" seal, marketed in this country by Aluminium (II.), Ltd., a tamper-proof hermetic closure, very suitable for use on products requiring only a single seal. Top pressure in the sealing machine forms a hermetic seal between the glass and the sealing medium, and this top pressure is maintained until the cap is retained by the tension on the metal flange, which is rolled under the lip of the glass finish.

The cap is readily removed by tearing the soft aluminium tab and destroying the ring of the seal which holds the sealing medium in position. The cap will hold high internal pressure, and can be applied with or without vacuum by a variety of machines supplied by the maker.

An Aluminium Roll-on Seal.

The "Hazel" cap is also manufactured by the same firm; it is intended for use with wide-mouthed packs requiring sterilisation. This is a "side seal," or one having its sealing medium in contact with the side of the glassware, and it is particularly useful for sterilised packs. It is essentially a vacuum pack, and is applied with initial vacuum.

The rubber side sealing medium does not at any time come into contact with the product, and so the possibility of the goods acquiring a flavour from the

rubber is entirely removed, as only pure aluminium coated with special lacquer is at any time exposed to the product.

Roll-on seals, familiarly abbreviated to "r.o.," are, in their final state, screw caps, but possess certain special advantages. They are sent out to the packer in the form of unthreaded caps. The cap is dropped on to the already filled container, which is then placed in the sealing machine. The first step in the sealing operation is the application of a steady downward pressure on to the cap of approximately 10 lb. per millimetre of its diameter, which firmly embeds the bottle neck into the sealing medium. From this moment until the moment it is opened the cap and the container are as one unit, for, before this "top pressure" is released, revolving rollers close in and roll the threads into the cap in conjunction with the threads on the glass, thus holding the sealing medium under compression until the seal is removed by the consumer. The caps can be aptly described as "tailor-made," since the thread on each cap must conform exactly with that on its container, and, in consequence, the seal is always easily removed.

The "Phœnix" type metal cap is another well-known pattern closure. It consists of a fairly tight-fitting cap, which is locked on to the jar or other container by a flexible, shouldered metal strap. The seal obtained is very firm indeed, perfectly hermetic, while the method of opening presents no difficulty. The cap can also be used, after the band has been removed, as a protective covering for the jar. It is extensively used for such articles as pastes and pickles, etc. The original owners of the "Phœnix" patent, the Wallis Tin Stamping Co., Ltd., also manufacture various other types of metal seal. One of these is the "Allmet" cap, for an all-metal seal for jams, etc., which can be applied very rapidly. It is tamper-proof, and can be applied with or without vacuum.

The "Phœnix" seal is certainly rock-firm, and the retaining band can readily be removed by the consumer, but the cap, when once deprived of its locking strap, is too loose a fit on the jar to retain the contents if it should chance to be knocked over.

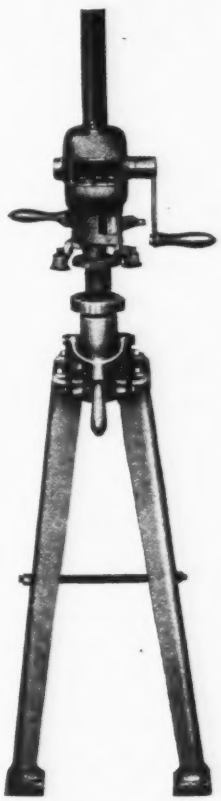
A variation of this type has been produced by Sutax, Ltd., who market a seal which retains the locking band, which ensures an evenly distributed pressure on the sealing washer, but which has the inner lid of the "Phœnix" seal replaced by a half-turn cap, which engages with lugs moulded in the jar. Thus the container can be resealed as often as desired, and is made perfectly leak-proof. This closure is suitable for such products as pickles, chutneys, mayonnaise, salad cream, export jams, potted fish and meats, olives, mustard, malt extract, horse-radish, etc.

The "Royen" closure, manufactured by the same firm, is another improvement. In this case, also, the "Phœnix" band is employed, but the inner cap is of the "snap" type, capable of being resealed indefinitely and quite leak-proof. It is suitable for much the same range of products as those given for the previous seal.

Machines for the application of these closures are produced in sizes ranging from small hand or pedal operated machines capable of capping approximately twenty-five containers a minute to multihead and rotary automatic machines capable of dealing with the largest outputs. The method of application, which is covered by patents, is ingenious and efficient, while at the same time simple and trouble free. The caps are sealed to the jars by a resilient spiral spring, which exerts a considerable, though gentle, constricting effect on the band, drawing it down and turning it under the sealing rim of the container without any underneath pressure. A uniform, efficient closure is obtained, and the risk of glass breakages is eliminated.

The use of corks as bottle-stoppers is said to date back more than 2,000 years, and they are even to-day probably the most widely used type of closure. Cork has several natural properties which render it suitable for this duty; it is resistant to the penetration of moisture, very few liquids (only highly corrosive acids and alkalies) attack it, while its natural elasticity and resilience combine to make it grip the bottle neck firmly and stay in place.

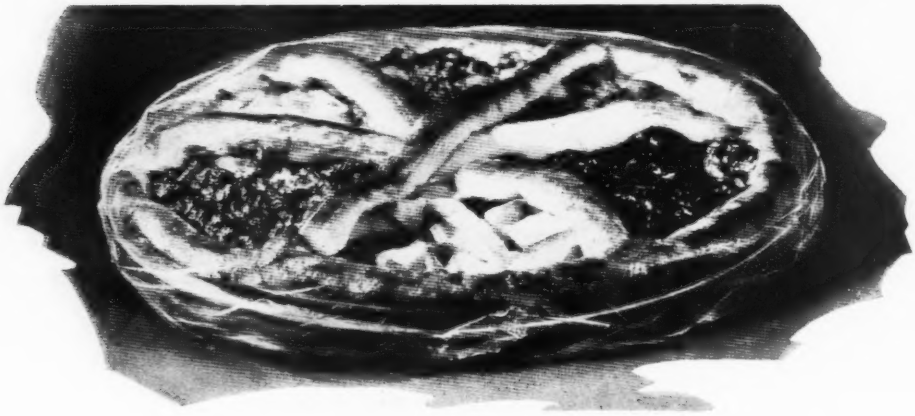
Its very great frictional properties, which make cork so efficient as a stopper, lead to one of its few drawbacks; it is often very difficult to withdraw the cork without injury by the corkscrew impairing it for future use. This is entirely avoided by the



An A.B. Hand Machine for "R.O." or "Goldy" Seals.

modern composition-topped cork, which can be used indefinitely. This type is provided with a strong moulded top, cemented firmly to the cork, which enables the stopper to be removed and replaced as

(*Continued on page 49.*)



Transparent Wrappings

This article discusses the use of transparent wrappings for foodstuffs. It also goes into the important question of testing these materials and records the results obtained by a research chemist who determined the permeability of wrappings for chocolate.

DURING THE past few years the use of transparent wrappings for foodstuffs has grown enormously in popularity. The reason for this may be sought in the combined influence of several factors. In the first place, all parties concerned with foodstuffs—manufacturers, retailers, and the consuming public have come to appreciate the importance of protection from contamination and the vital necessity for hygienic handling. Being impervious to air, grease, germs, and other sources of contamination, and, in certain instances, to both water and water vapour, transparent wrappings perform, in the above-named respects, a service of paramount importance in modern food packaging. It may, however, be pointed out that these qualities are not confined to transparent wrappings alone—there is, for example, wax paper and parchment; but, although the latter possess several special advantages, transparent wrappings have one outstanding property which sharply differentiates them from materials of a similar nature and sphere of application—we refer to their transparency. With the increase in public sensitivity to the unclean and the spread of common knowledge relating to germs, preservatives, contamination, and so on, there has grown up a corresponding caution on the part of the purchaser and a desire to *see* what he is buying. No doubt this combination of transparency with impermeability, durability, flexibility, etc., is at the root of the increased popularity of transparent wrappings for foodstuffs.

Types of Transparent Wrappings.

Transparent wrappings are made from either a gelatine or a cellulose base. They show certain points of resemblance, but are easily distinguished when a small piece is burnt in a flame—the gelatine material giving a characteristic " horn " smell, while the cellulose gives a definite smouldering paper smell.

The following discussion will confine itself to two types of materials—viz., (1) transparent wrappings of gelatine base, and (2) transparent cellulose wrappings. As representative of the first type we have taken " Pliaphane " as an example, and of the second type, " Cellophane." There are, of course, other special makes of excellent repute, but the two examples are representative in embodying the latest advances in manufacture, and the makers have generously placed at our disposal a considerable amount of data relating to their uses and properties.

Glascine and wrappings of a semi-transparent character are discussed in the article dealing with packaging. An interesting innovation may be conveniently mentioned at this point; an American firm is experimenting with the manufacture of transparent cellulose cans and rigid containers generally from a material named " Hyguloid." This material is said to be odourless and colourless. Cans with ends of enamelled tinplate are cut from seamless tubes of the " Hyguloid," and the ends are double-seamed or crimped in the usual manner. Such containers are flexible, light in weight, and transparent.

Part I.—Transparent Wrappings of Gelatine Base

Since the introduction of improved methods of manufacture, this type of wrapping (of which " Pliaphane " is an example) has been increasingly employed for a large variety of foodstuffs and other products. The basis of these wrappings is gelatine, which is treated by special processes to prevent it from becoming sticky with moisture and to enable it to withstand atmospheric conditions. In the particular case of Pliaphane, the somewhat laborious and, in other respects, unsatisfactory methods of manufacture by hand have been replaced by a con-

tinuous process involving ingenious machinery whereby large outputs of uniform grades are obtainable, and the former tendency towards fracture has been overcome. The product is quite transparent, possesses a surface free from imperfections, and is manufactured in sixteen different thicknesses, the thinnest being the one largely used for wrapping purposes, except where sharp corners or very heavy articles are concerned. Printing can be done in gold or any other colour. From the heavier gauges, containers of any shape and size can be manufactured for a variety of articles. Such containers are non-inflammable and are treated to render them resistant to climatic conditions, and they may be of any desired colour.

Part II.—Transparent Cellulose Wrappings

The raw material for the manufacture of transparent cellulose wrappings (such as "Cellophane") is pure cellulose in the form of selected spruce pulp or cotton pulp. Using the viscose process, the pulp is transformed into colloidal solution, and the cellulose is regenerated into continuous transparent films—hence the term "regenerated cellulose films" sometimes used for this material. There is no need here to give details of the manufacturing processes employed; a good account of these was given by W. L. Hyden, of the Technical Department, Du Pont Cellophane Company, Inc., Buffalo, N.Y., in *Ind. Eng. Chem.*, 1929, May, pp. 405-410, and some important theoretical considerations involved have been discussed by Kita (see *Cellulosechem.*, 1929, Vol. 10, p. 134, and *Sci. Papers Inst. Phys. Chem. Res.*, Tokyo, 1929, Vol. 2, p. 171). Sufficient to say that after thorough washing, then passing through an aqueous solution of pure glycerine, and subsequently drying, the film is cut into sheets nearly 40 ins. long and varying in width between 33 and 38 ins., or is slit into rolls of various widths. A number of rigid inspections ensure the elimination of any material which does not conform to standard requirements. The standard thickness is approximately nine ten-thousandths of an inch; greater thicknesses up to six one-thousandths of an inch are also manufactured.

In addition to the colourless material, a variety of shades and embossed effects is also obtainable. It may also be printed. There is no difficulty in forming it into bags, envelopes, tubes, etc.

Applications.

Owing to the fact that Cellophane is transparent, lustrous, durable, flexible, and impervious to air, grease, and sources of contamination, it is admirably adapted to the wrapping of foodstuffs, such as candy, chocolates, cake, biscuits, nuts, marshmallows, dates, and many other products. Moreover, a special moisture-proof variety is impervious to both water and water vapour. The ordinary kinds are transparent to ultra-violet light, and both ordinary and moisture-proof kinds, being pure regenerated cellulose, are absolutely non-toxic and free from adverse physiological effects, as has been demonstrated by feeding experiments on animals. Thus it makes a highly protective, hygienic, economical, and artistic wrap for an extraordinarily wide range of products.

Cellophane-Wrapped Plum-Pudding.

For boiled sweets, and also dried nuts, double wall mandrel packing—which is a compromise between wrapping in sheets and filling ready-made bags—is recommended. For this purpose two sheets of Cello-

phane are used, one moisture-proof and the other plain 300, the former being on the inside, so that the labels are stuck to the outside sheet of plain Cellophane.

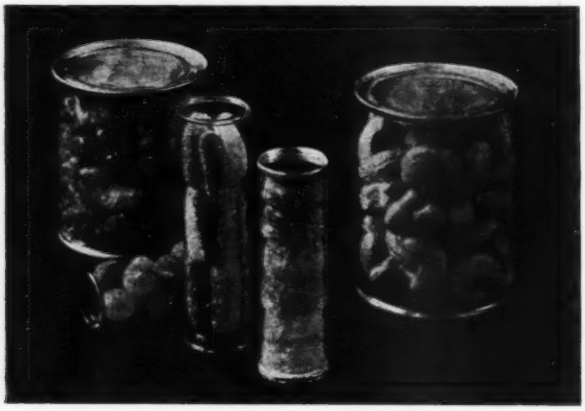
An interesting and growing application of Cellophane is for casing sausages, especially dry sausages, such as Salami and Lyons. Some of the advantages claimed are as follows: Absence of mould, uniform diameter, indefinite length, ready separation from the

meat, uniform drying and colouring, does not burst on proper filling or cooking, does not become sticky, is quite transparent.

Among other applications may be mentioned the packaging of sliced bacon, cuts of meat, fillets of fish, smoked herring, hams, and with the advent of frozen foods, frozen fish fillets and frosted strawberries. In all these cases—even more than with cake, biscuits, and sweets—it is essential for the purchaser to *see* what he is buying, and in this respect—apart from its protection from dust and handling—the display value of the transparent wrapping cannot be underestimated—in fact, it actually stimulates a positive urge to buy.

Moisture-proof Wrappings.

According to Hyden, the ordinary grades of transparent wrapping permit the penetration of water *vapour* (*ibid.*, p. 409), and they are subject in some



Candy and Nuts Packed in Hygaloid Containers.

degree to shrinkage and expansion with changes in atmospheric humidity. It is important to note, however, that a special type of transparent cellulose wrapping (such as "Moisture-proof Cellophane") is marketed which is not affected by moisture, and is particularly suitable as a wrapper for products which lose or absorb moisture when exposed to air. This material, besides being lustrous and quite transparent, has the property of excluding outside moisture or of retaining the original humidity value of the wrapped product. Whenever food manufacturers are in doubt as to which type of wrapping—ordinary or moisture-proof—is the more suitable for their purpose, they should consult the makers. The same advice applies to the question of the selection of adhesives, as certain difficulties are involved in the sealing of moisture-proof wrappings owing to the fact that the surface of this material is coated with a varnish impervious to moisture, and the ordinary glues and adhesives cannot be used.

Hyden has given the results of some experiments carried out to compare the permeabilities to water vapour of various wrapping materials:

Materials.	*Diffusion of Water Vapour at 100° F., Mg. per sq. m. per hour.*
Moisture-proof Cellophane ...	270
Waxed brown paper	400
Waxed glascine paper	530
Average of 15 waxed papers ...	22,200

In these experiments the material to be tested was sealed over a glass dish containing water, which was placed in an air oven at 100° F.; the air was circulated by a fan and desiccated by concentrated sulphuric acid contained in trays.

In order to illustrate the efficacy of this moisture-proof wrapping for materials sensitive to humidity, the results of two sets of tests are given below. Although in the first case the product wrapped was biscuits, and in the second case chocolates, the general results apply with equal force to any other product required to be protected from variations of atmospheric humidity or whose original moisture-content is to be preserved unchanged.

Test No. I.—According to Hyden, 40 grams of soda-cracker biscuits, sealed in a large paper envelope and exposed at 70° F. and 70 per cent. relative humidity for 48 hours, showed a gain in weight of 3·1 grams. A similar test using Moisture-proof Cellophane showed a gain of only 2 grams after 6½ months' exposure.

Test No. II.—Recently a series of tests was carried out in London in connection with the wrapping of chocolates. The wrapping (both moisture-proof and ordinary types) was exposed to an atmosphere of 60 per cent. relative humidity and pieces 24 cms. square were accurately cut. These were then exposed to an atmosphere of 95 per cent. relative humidity for two hours and then remeasured. They were then placed in a desiccator in which the air was thoroughly dry and left for several hours until no change in length was noticed. A similar procedure was followed by taking the wrapping from the dry atmosphere and replacing it in the saturated, and then finally exposing it to normal 60 per cent. humidity.

The following results show the variations in length which the ordinary wrapping undergoes as compared with the special moisture-proof variety.

Exposure.	*Moisture-proof Type (Standard Thickness).*	*Ordinary Type.*
	(*Cms.*).	(*Cms.*).
From normal atmosphere to saturated	24·0 to 24·0	24·0 to 25·1
From humid to dry ...	24·0 to 23·6	25·1 to 23·6
From dry to humid ...	23·6 to 23·9	23·6 to 25·5
From humid to normal	23·9 to 23·7	25·5 to 23·9
Maximum expansion	23·6 to 24·0	23·6 to 25·5
Maximum percentage expansion	1·7 per cent.	8·0 per cent.

A variation of 8 per cent. in length has a material effect when the material is wrapped around a chocolate box. If the wrapping is put on the box when it is at its minimum length—*i.e.*, when it is exposed to a dry atmosphere—and is afterwards exposed to a humid atmosphere, it will lose its tautness and become "saggy" and crinkled, thereby giving the box a badly finished appearance. Conversely, if it is put on in a damp atmosphere it will contract when exposed to a drier air and become so taut that it will crinkle the box. It is therefore essential when using ordinary transparent wrapping for boxes to expose it first to an atmosphere which will bring it midway between its maximum and minimum lengths. By so doing, subsequent exposure to varying atmospheric conditions will not have such a drastic effect on the appearance of the wrapping of the box.

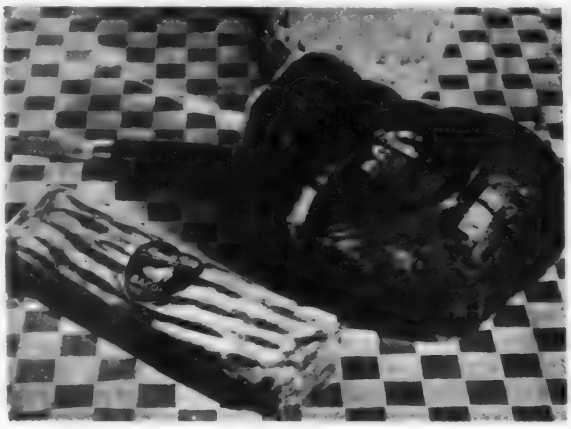
Chocolates from the same batch were taken and placed in two glass dishes. The tops of the dishes were covered with the wrapping under test and a complete and perfect seal made with paraffin wax. The dishes were then placed in an atmosphere of 90 per cent. relative humidity at a temperature of 70° F. for five days. The observed results were as follows:

Time.	*Moisture-proof Transparent Wrapping.*	*Ordinary Transparent Wrapping.*
1 hour	Chocolates perfect	Chocolates dull off badly.
24 hours	Chocolates perfect	Chocolates covered with beads of moisture.
48 hours	Chocolates perfect	Chocolates very bad colour and covered with syrup.
5 days	Chocolates perfect	Chocolates very bad colour and covered with syrup.
(The dishes were then removed from the humid atmosphere and placed in the laboratory at average temperature and humidity.)		
6th day	Chocolates perfect	Chocolates covered with syrup and crystals of sugar.
6 weeks	Chocolates perfect	Chocolates covered with a heavy mould growth, and were unrecognisable.

From these results variations in transparent wrappings and the consequences of their use can be better appreciated.

It thus appears that:

1. All transparent cellulose wrappings are not moisture-proof; on the contrary, the majority are pervious to water vapour. Only those varieties

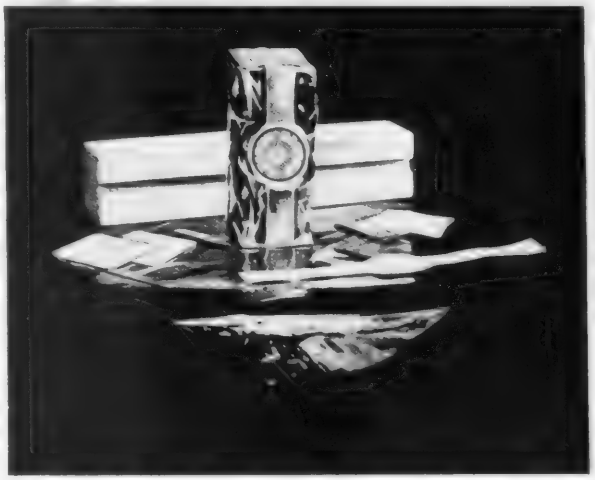


which are definitely specified by the makers to be impervious are moisture-proof. As a safeguard it is advisable to carry out such tests as have been suggested above.

2. When using the moisture-proof variety for the wrapping of chocolates, it is necessary to have a perfectly tight seal. It is not good practice to use a special paper to eliminate moisture penetration and then leave spaces for ingress through imperfect sealing. To ensure a perfect seal, the type of fold should be studied, and a special adhesive used as supplied by the manufacturers of the paper.

Precautions should also be taken that the air inside the package at the time of packing is relatively dry, for it must be remembered that not only does the waterproof wrapper exclude moisture, but it will retain any which is inside the package.

Packing material, such as the cardboard box



"runners," shavings, and the like, should all be thoroughly dry and—for ideal results—the box

(*Concluded on page* 47.)

Factory-Packing the Food Product

The whys and wherefores of packaging are discussed, its advantages for manufacturer and retailer pointed out, and modern styles and methods described.

THE NUMBER of food preparations which are now issued by manufacturers in individually packed form has increased so rapidly in recent years that it is worth while considering for a moment exactly why this has come about. There are some articles which from their very nature could not well be marketed in any than packaged form, but there are many others which even in recent years were customarily sent out in bulk, the actual packaging being done by the retailer over the counter and then only very simply, and which to-day are almost invariably packaged in the factory. Various reasons may be adduced to account for this change, the chief of which is no doubt the realisation that the small container is capable of fulfilling an important function other than that of acting as a convenient and hygienic receptacle. We refer to its potentiality as a powerful sales force.

It is now recognised that the container, be it carton, bottle, tin, box, or bag, has, generally speaking, four duties to perform; it is a convenient receptacle, a protector, a salesman, and an identification for the contents.

As a receptacle, pure and simple, it facilitates handling and transport, and saves the retailer a great amount of labour in weighing and packaging. The ultimate cost to the consumer is reduced, because weighing, filling, and packaging are linked on to the chain of factory operations and can be performed on a mass-production scale by automatic machinery.

As a protector it ensures hygienic conditions, and protects the contents from deleterious atmospheric conditions and also from damage by handling. The dangers of contamination are minimised, as also are the adverse effects of moisture penetration. Then, again, there is the protection against loss through leakage, pilfering, and pests. The container is the guardian of the purity and flavour of the product.

As a salesman it can become the most efficient and economical member of the staff. Attractive containers lower sales resistance and increase sales energy.

Fourthly, the container serves as a means of easy identification of any product. If it has a utility or decorative value, it assumes the status of a more or less permanent advertiser—a constant reminder and memory jogger.

Publicity Value.

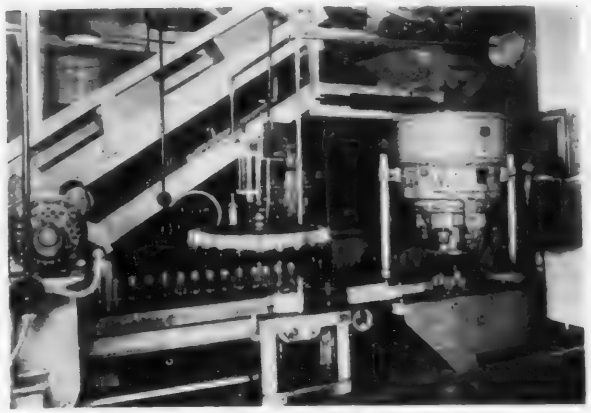
Perhaps its principal value, however, lies in the fact that it retains to the manufacturer a larger part of the goodwill that is his by right, and makes his connection with the ultimate consumer more direct and definite. In the same way, now that there are so many "lines" clamouring for attention, it is only natural that an attractively designed package, probably far above what the individual retailer could achieve, should play a great part in effecting sales and in popularising any given product. Given two articles of equal value, the more attractively dressed one, surely, has the advantage. In America, where public taste is rather more fickle than here, it is stated that 85 per cent. of all products are sold on appearance, and certainly it is true that most first sales are effected at sight; the "prospect" is greatly influenced by the appeal to the eye—and this is where the container comes into action. The housewife *instinctively* judges the quality of the contents by the momentary impression made by the outside package. A message of pleasurable anticipation is conveyed without conscious effort on the buyer's part; the container has performed its task successfully; it now remains for the contents to live up to expectation, otherwise disappointment results and the good beginning has a futile ending.

Folding Boxes.

The folding box or carton is a very popular form of package; it has the advantage that it can be stored in a flat condition (and therefore economically in respect to space) until required for use. Such cartons are bound together by means of adhesives; those belonging to the collapsible wire stitched or taped box class—also folding flat—are held together by wire stitching or gummed tape, or both. Most cartons are made from one piece of board, which is so cut, creased, and printed that it can be assembled easily. The blank is prepared and is ready for use immediately by being bent along grooved lines until the box is formed by interlocking, or, as in some types, one side of the blank has a narrow flange which is glued to the opposite side to form the box, leaving the adjoining flaps for closure. For such a box it is necessary to use a thin, pliable, and strong board, and the one generally chosen is a plain or coloured "folding boxboard," which is also suitable for decoration by an embossing process.

The three methods of making the carton are by means of: (1) The cutting and creasing platen press; (2) the cylinder cutting and creasing press; and (3) the rotary multi-colour printing, cutting, and creasing machine. Glueing is effected by use of a folding box glueing machine.

Various kinds of printing machines can be used for decorating the board to be made into cartons. For small sheets, a platen press is sufficient, but where large sheets are used with a number of cartons to be worked on each sheet, it is best to use either a rotary lithographic or offset press, which runs at a high speed and yet produces very high-class printing. The main points to be considered in the choice of such a machine are: (*a*) Good ink distribution, so that extreme solids can be printed without any clogging of ink on the ink plates; (*b*) accurate



Karl Kiefer Rotary Vacuum Filler with Automatic Feed and Discharge.

A Kiefer Visco Machine, Filling Cream and Discharging onto a Conveyor-Cooler.

register for two and three colour work; and (*c*) the control and delivery of the printed sheets to ensure a high output.

British manufacturers have made remarkable advances in the development of rotary carton-making machines during the past few years. An example of such a machine is the multi-colour rotary carton-making machine, made by the Thrissell Engineering Co., Ltd., which produces cartons, wrappers, etc., direct from the reel, completely cut, creased, or scored, embossed (if necessary), printed in any number of colours (including bronze), counted, stacked, and delivered, with all the waste automatically removed in the one operation. These machines are made in a variety of types and sizes to cover the general container trade and, in addition, possess the following advantages:

1. The cutting and creasing operations are performed by entirely rotary methods, which not only enable the highest possible output to be obtained but also ensure absolute accuracy and consistency in size and shape of product—a very important point to-day when many cartons are packed by machine.

2. All the cutting and creasing knives on these machines are carried on one pair of rollers only, so that perfect register is always assured—another very important point where machine packing is concerned.

Another machine for special note is the "Staude" automatic folding box gluer. This machine feeds, folds, glues, counts, and stacks blanks for folding boxes of all usual kinds and delivers the finished cartons at speeds up to 2,000 per minute. The improved screw adjustment enables an easy and rapid change over from one job to another to be made. A further development of this machine renders possible the manufacture of an entirely new style of box of the rigid set-up box type, but collapsible.

Rigid Paper Boxes.

These are usually produced from a very light board, the box being made rigid and upright by the use of adhesives. From the point of view of their construction, they fall into three groups: (1) The one-piece box, in which the four sides and the bottom are cut as one blank from a single sheet of board; (2) the end-pieced box, in which the box is formed from three pieces of cut board—namely, one forming two sides and the bottom and two forming the end pieces; (3) the shoulder box, in which the outside is made as a single blank as for the one-piece box, and the shoulder or neck is made as a narrow strip of board, generally lined with white enamelled paper, with three scored lines to make the four sides. The lids are made according to either the one-piece or the end-pieced method. "Box blank" is the term used to denote the shaped piece of board, cut to size and ready for folding or breaking up.

Waxed Paper Containers.

First introduced for the sale of such commodities as cream and ice-cream, this type of container is now widely used for articles like honey, milk, marmalade, jam, preserves, syrups, and lard. One of their very latest applications has been in the packing of rapidly frozen fruits and berries. They are all "single service" containers—*i.e.*, they are not collected for return to the factory for refilling, and thus have hygienic advantages; they are moisture-proof, light in weight, and economical. The carton is machine produced, much in the ordinary way, special attention being given to the locking of the side and bottom seams.

The original method of wax treatment was to apply hot paraffin to the surfaces of the container, then cooling by a blast of air. The same process is still followed with the use of improved machinery. This "hot wax" treatment may be recognised by the dull finish it gives to the container.

In later years the "hot wax" treatment has been replaced to a considerable degree by the popularity and attractiveness of what is termed the "high gloss" finish or "cold wax" treatment. This particular treatment is accomplished by the quick immersion of cartons, printed and cut, into a bath of hot paraffin, which is maintained at a fixed temperature. Following this, they are immediately chilled in a bath of ice-cold, pure, flowing water. This process not only makes for an improved appearance of the carton itself compared with the old-style, dull-finished job, but it also affords speedier production. The "high gloss" paraffined carton gains its name

from the bright, reflecting, paraffined surfaces of the container. Any necessary printing, of course, has to be done prior to the wax treatment.

Wrappings.

For either container lining or direct wrapping purposes, there are available many kinds of "paper" more or less impervious to grease, water, water-vapour, and/or air. Some of these are transparent, others are only partly so; as representative of the former kind, *Transparent Cellulose Wrappings* and *Transparent Gelatine Wrappings* are dealt with on another page of the present issue. Translucent wrappings include, for example, parchment paper, greaseproof paper, glascine, wax paper, and waxed glascine.

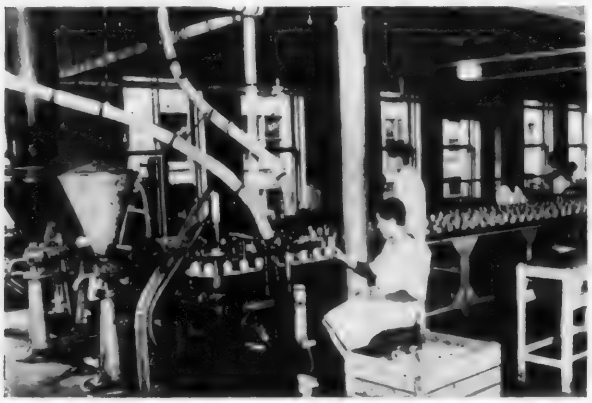
Parchment (of which vegetable parchment is an example) is well adapted for food wrapping, as it is claimed to afford the maximum protection against air, water, and grease, and all kinds of contamination; at the same time, it contains nothing likely to injure the food around which it is wrapped. At present over 80 per cent. of the vegetable parchment produced is used for wrapping butter, margarine, and lard, but it has, of course, a much more varied field of application; the material is capable of being coloured—very attractively—by the use of special dyestuffs. Various grades are made for special purposes. The parchmentising of the paper is carried out in a bath of strong sulphuric acid, followed by washing and drying. A complete transformation of physical structure takes place and the fibres are cemented together; the original pores are closed and the strength of the material is increased.

In the manufacture of *Greaseproof Paper*, spruce pulp is beaten much longer than if it were to be used for ordinary paper, and the fibres become hydrated and the texture "gelatinous." It is cheaper than parchment, and is inferior in "whiteness," bulk, strength, and greaseproof qualities; the two may be distinguished by boiling in water, when imitation parchment is reduced to a soft mass, while genuine parchment will stand boiling without disintegration.

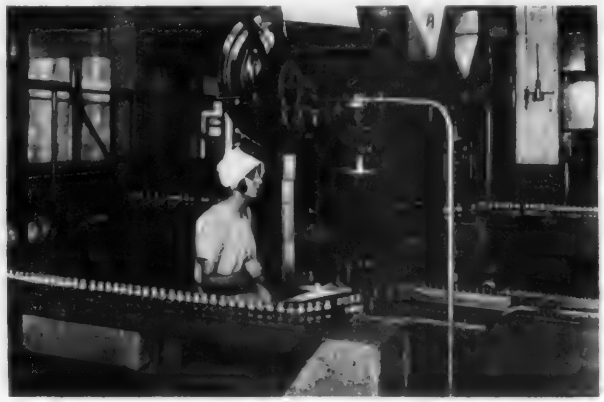
To make greaseproof paper into *Glascine*, the paper is polished in super-calenders, thereby imparting various degrees of transparency and enhancing its greaseproof qualities. It can be glued and embossed.

Wax Paper is made by applying melted wax to paper. The wax should, of course, be odourless, colourless, and of high melting-point. "Wet wax" means that most of the wax is left on the surface of the paper. It is the commonest type, but is not adapted to all purposes. "Dry wax" paper has the wax driven into the sheet by pressing between rollers. The paper does not hold as much wax as when "wet waxed," but it has advantages for use in hot climates and for certain special purposes.

It is impossible to treat this subject of wrappings in a satisfactory manner owing to the lack of definite data regarding properties such as transparency, strength, permeability to grease, water, water-vapour, and air, expansion and contraction with change in atmospheric humidity. Obviously, it is useless to speak of particular wrappings as being "greaseproof," or "waterproof," or "absolutely waterproof," when the few recorded experiments, however crude, have indicated that these wrappings permit the passage of a certain, though admittedly small, percentage of grease or water. Moreover, a distinction between water and water-vapour is not always made. Thus H. A. Stone, writing on the subject of glascine and wax papers in *Food Industries*, pp. 14 and 15, January, 1930, remarks that wax paper is "relatively moisture-proof and quite greaseproof," and, again, that "ordinary wax paper is practically waterproof, but waxed glascine is absolutely so." To the ordinary reader these statements may mean anything, and they should be substituted by definite data of the relative degrees of permeability of various types of wrappings to various substances—such as grease, water, and vapour—the determinations having been made under precisely stated and preferably standardised conditions. Until this is done there can be nothing but confusion and uncertainty. It should be pointed out that Stone has given some results of measurements, but these are practically worthless from a strictly technical standpoint, owing to the fact that the determinations were not carried out under properly controlled and adequately stated conditions. Nevertheless, although he claims that waxed glascine is *absolutely* waterproof, his own experiments are recorded as showing that dried corn flakes wrapped in this material gained in weight to the extent of nearly ½ per cent. after several days' exposure to the atmosphere; compared



A Visco Machine Filling Cream.



A Kiefer Automatic Screw Capping Machine.

with this, corn flakes wrapped in waxed sulphite paper showed a gain of 4½ per cent., while when put up in the ordinary paper carton the gain was 10¼ per cent.

It is to be hoped that someone will undertake the work indicated above, so that we shall know exactly what to expect from the use of any particular type of wrapping for any particular foodstuff under specified conditions. Some hints as to what is required are given in the article on "Transparent Wrappings" in this issue; the scope of the work must, however, be far more comprehensive, and the conditions under which determinations are made should in each instance be stated in detail and, preferably, standardised.

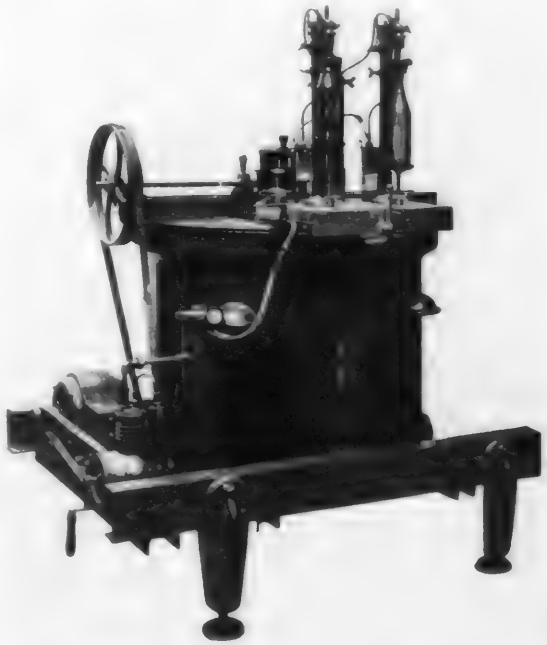
Paper Containers by Packs (1925) Ltd.

Package Filling and Sealing.

Great progress has been made in the design of automatic machinery for filling, weighing, sealing, lining, wrapping, and labelling cartons, and in the modern food factory such machinery constitutes an extremely important section of the general equipment—indeed, under conditions of mass-production, it is undoubtedly essential. When linked up directly to a carton-making machine and to a labelling machine, a complete unit is provided, whereby board fed in at one end emerges as filled and labelled cartons at the other.

A machine by Messrs. Rose Bros. packs cereals, powders, or granulated substances in cartons at the rate of 55 to 70 per minute, one attendant only being required to keep the gum reservoirs and carton stack or reels of board replenished. The cartons are fed from a stack and opened up automatically, after which the bottom flaps are gummed, folded, and securely fastened under great pressure. They are then transferred to an upright position and passed under automatic weighers and fillers. After being filled, the top flaps are gummed and folded, and the carton is passed between belts, where it is held until the gum is secure. In cases where the carton is unprinted, a roll feeding apparatus is provided, which automatically punches, scores, and cuts the blank to shape from a plain roll of cardboard. Another granulated packing machine made by the same firm is equipped with a quadruple set of electrical weighers, and works in combination with a labelling machine, which applies a three-quarters band label covering the seam and both ends of the packet.

In the case of bottles, filling equipment can be divided into two types, accordingly as it is operated on the gravity-pressure or vacuum systems. The former type is the most simple, and is suitable for fluids and semi-fluids which are not of too viscous a nature. The output of such types is usually up to about thirty-five bottles per minute, according to the type and size of filler. For a great number of products the vacuum filling machine is more efficient. In general, the vacuum filling system consists of a supply tank, usually situated on the floor, an overflow receptacle, and the vacuum pump. From the supply tank issue a number of filling lines which terminate in nozzles fitted with soft rubber gaskets. These are dropped on top of the bottles, and a second tube in the gasket, connected with the pump, evacuates the bottle and the liquid flows from the supply tank on the floor into the bottle. If the bottle is imperfect or cracked no vacuum can be created in it and no liquid will flow. Such vacuum filling machines operate entirely without mess or drip, and neither the outside of the labels nor the bottles come into contact with the liquid. The basic principle, outlined above, is applied to several types of vacuum fillers, varying considerably in design and capacity. Outputs vary from the smallest types, filling not more than one or two bottles at a time, to the largest fully automatic machines which fill and cap one hundred and forty bottles per minute regularly throughout the day.



The "Albro" Combined Vacuum Filler and Mixer.

(*Continued on page* 53.)

Acts, Orders, and Cases controlling Packing Processes

Important Legal Rules

By W. SUMMERFIELD, M.A., B.C.L., LL.B., BARRISTER-AT-LAW.

THE CONTROL exercised by English law over the food manufacturing industries is stringent and detailed. In some cases—*e.g.*, that of milk products—it is true to say that at every stage of production and distribution special Acts and Statutory Orders guide the seller and safeguard the buyer; in all cases, legal control over the packing and subsequent transport stages is considerable in extent and extremely important in its implications and consequences to all engaged in the industries.

Over and above the special Acts and Orders of which a knowledge is essential to the food manufacturer in connection with his packing problems, there are numerous legal rules derived from the general law of the land which also directly affect food packing questions.

Special Packing Statutes.

The Railways Act, 1921 (11 & 12 *Geo. V.*, *c.* 55). This Act gave effect to the rationalisation schemes introduced by the grouping of our railway transport services. Sections 42 to 45 laid down standard terms, conditions, and rates for the carriage of goods classified in three categories—viz.:

1. "Company's risk conditions," for (*a*) livestock and (*b*) other merchandise, to be carried at ordinary rates.

2. "Owner's risk conditions," sub-divided as in 1 above, for carriage at "owner's risk rates."

3. "Damageable goods not properly protected by packing."

A "Railway Rates Tribunal" was authorised to settle in detail the terms and conditions after consultation with the companies; these were published as No. 1,009 of the 1927 Statutory Rules and Orders, by H.M. Stationery Office, and took effect as from January 1, 1928. This code of regulations comprises lengthy sets of conditions, lettered "A" to "O." The set lettered "E" deals with "Damageable goods not properly protected by packing when carried by merchandise train at company's risk rates," and comprises twenty-eight "Conditions"; of these, Nos. 3 and 4 merit special notice. To render the company liable for loss or damage the trader must be able to prove that such would have arisen even if the goods had been properly packed *or* that it resulted from the company's wilful misconduct.

When can it be argued that goods are insufficiently protected by packing? An illuminating case is *London and North Western Railway Company* v. *Richard Hudson and Sons, Limited* (1920), A.C. 324, where the House of Lords held the railway company liable for loss occasioned to goods by rain water percolating through defective sheeting supplied by the company with the trucks used, although the consignors did the loading under a special contract.

The Act of 1921, it is to be noted, preserved the right of a trader to make a special contract with a railway company, subject to the rules laid down in the Railway and Canal Traffic Acts, 1854 and 1888.

"Insufficient protection of goods by packing" has been before the courts for interpretation, also, in connection with the provisions of the *Carriage of Goods by Sea Act*, 1924 (14 & 15 *Geo. V.*, *c.* 22). Rule 2 (*n*) of Article IV. of the Schedule of that Act gives statutory force to the regulations in this connection which were agreed upon by the International Conference on Maritime Law, held at Brussels in October, 1922. Seventeen classes of causes are specified in the Rule, which confer immunity upon the carrier and the ship, of which "insufficiency of packing" is No. 14. The meaning to be given to the term was discussed at length in *Goodwin, Ferreira and Company, Limited* v. *Lamport and Holt, Limited* (1929), 141 L.T. 494, where the court laid it down that the expression might cover cases where:

(i.) The goods damaged in respect of which compensation is claimed were themselves insufficiently packed.

(ii.) The goods damaged were injured owing to insufficient packing of other goods belonging to the same proprietor.

(iii.) The goods damaged were injured owing to insufficient packing of other goods belonging to a different proprietor. *Goodwin, Ferreira and Company's* case fell under this third heading.

An illustration of (ii.) is to be found in *Silver and Layton* v. *Ocean Steamship Company* (1930), 1 K.B. 416, C.A. There, the plaintiffs were awarded compensation in the sum of £2,100, representing 60 per cent. of the total damage occasioned to their consignment, shipped from Shanghai to London, on the *Æneas* belonging to the defendants. The consignment consisted of two parcels of frozen eggs, packed in square-cornered tins, which arrived in London damaged, some of them badly gashed and others with small holes. The defendants had given a clean bill of lading, but at the trial set up the defence that the goods were not received in good order and condition owing to the manner of their packing. Amongst other problems considered by the Court were: (*a*) The relative merits of square-cornered tins and circular drums; (*b*) the desirability of cloth, fibre, or cardboard covering for the handling of tin packages of frozen commodities; (*c*) the proper thickness of the metal of packing tins. Square-cornered packages might, it was pointed out, be more liable than circular ones to damage other packages, but, on the other hand, they saved space in ship stowage; furthermore, careful stowage could reduce the risk of damage resulting from square corners to a minimum.

The Sale of Food (Weights and Measures) Act,

1926, affects manufacturers and dealers in "pre-packed" commodities. The expression "food" has a very wide connotation in this Statute, since it covers not merely "any article used for food or drink by man," but also "flavouring matters and condiments." The Act lays down maximum weights permissible for wrappers or containers of foodstuffs which are not sold by net weight. Foodstuffs are grouped under three headings:

(i.) Those which must be sold by net weight.

(ii.) Those which may be sold in wrappers or containers not exceeding 2½ drams per lb. of the commodity sold.

(iii.) Those which may be sold in wrappers or containers not exceeding a specified sliding scale of drams per lb.

Statutory Rules and Orders, No. 528 of 1927 (obtainable of H.M. Stationery Office), added numerous articles to the long lists given in the 1926 Act itself of foodstuffs affected by that Act's various regulations—*e.g.*, the requirement as to the statement in plain characters on the labels as to weights and net weights of the articles packed.

The special rules governing and restricting the sale of "pre-packed" milk should be borne in mind by all who deal in "skimmed, separated, and pasteurised milk," and "milk which has been subjected to any other process"; "dried" and "condensed" milk are, however, not included with the above.

"Passing Off."

The way in which a product is packed may be seriously objectionable in the eye of the law, resulting in an action for "passing off" against the packer. The manner in which a package is made up or labelled may be misleading, so that a purchaser thinking to acquire the goods of manufacturer A. may be deceived into purchasing those of manufacturer B. A. may then be entitled to apply to the Court for an injunction to prevent B. packing his goods with such deceptive similarity to the type of package or label which he has adopted and familiarised; furthermore, he may claim damages from B. for the loss of trade resulting to him from the deception.

In 1891 the House of Lords heard the leading case *Montgomery* v. *Thompson*, and restrained Mr. Montgomery, by the grant of an injunction against him, from carrying on a business at Stone, Staffordshire, under the designation of "Stone Brewery" or "Montgomery's Stone Brewery" with a view to marketing his product labelled "Stone Ales," under which name Messrs. Thompson and their predecessors had acquired a valuable trade goodwill for their ales by continuous user from the year 1780 onwards.

In *Ewing* v. *Buttercup Margarine Company, Limited* (1917), the defendants were prevented from manufacturing and selling as *wholesalers* margarine in packages labelled with the word "Buttercup," or marked with the "buttercup" design, on the ground that the plaintiff had carried on business under the name "Buttercup Dairy Company" since 1904, and was a well-known multiple *retail* shopkeeper under that name. This decision was made by the Court, although there was no proof that the defendants had intended to pass off their margarine as the goods of the plaintiff, of whose existence indeed they were unaware.

The get-up of the bottles and the question whether the trade mark name "Carvino" were too close an imitation of the "Wincarnis" get-up and name formed the subject-matter of an important action heard in 1911—viz., *Coleman and Company, Limited* v. *Stephen Smith and Company, Limited*.

Trade Marks.

Numerous difficulties have arisen in connection with the use of trade marks and designs upon packages of manufactured foods, both from the aspect of possible deception of purchasers and from that of obtaining the protection of registration. *The Trade Marks Act*, 1905, and the *Trade Marks Rules*, 1920, contain important regulations to be observed. The limits of the selling monopoly conferred by the use of a trade mark were discussed in the illuminating case of *Champagne Heidsieck et Cie Monopole Société Anonyme* v. *Buxton* (1930), to which reference was made in our last issue (reviewing the outstanding law cases of 1930).

General Law.

This, as indicated above, may affect packing particularly—and in a variety of ways. For instance, questions of libel law may arise from the use of a label or mode of packing. An example fresh in the public mind is the action of a well-known golfer against a chocolate manufacturer; the package itself, as also any advertisement matter accompanying or issued with it, may be objectionable in this sense. How far a rival trader may object to the extent of being awarded damages in a court of law was fully discussed in *White* v. *Mellin* (1895), A.C. 154, where the House of Lords was called upon to decide whether Timothy White, Chemist, of Portsmouth (as the firm then was), who owned "Dr. Vance's Prepared Foods for Infants or Invalids," might lawfully attach to the wrappers encasing the bottles of "Mellin's Infants' Food," which he sold in his shops, a label commending "Dr. Vance's" as "far more nutritious and healthful than any other preparation yet offered," and so, also, by implication than "Mellin's." Among other important issues raised by the case was the difficult problem of the legitimate limits of trading competition.

Transparent Wrappings (*continued from page* 41.)

should be packed and wrapped in an air-conditioned room.

The moisture-proof variety is not affected by humidity; hence, when wrapped on a box it will retain its tautness and not crinkle or become saggy.

3. The *non*-moisture-proof transparent wrapping is affected by humidity, and will expand or contract according to the conditions to which it is exposed. To get even tautness, therefore, it is advisable to expose it to an atmosphere the humidity of which will render it of average length just before wrapping round the box.

With the exception of the photo of Hyguloid containers, the illustrations shown in this article have been kindly supplied by the Cellophane Co., Ltd.

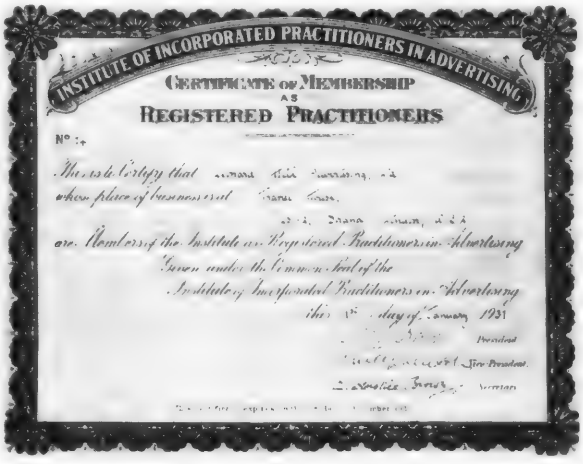
Publicity

By PUBLICIST

This is the first of a series of articles in which it is proposed to discuss publicity and advertising generally and various advertisements individually.

PART I

AT THE outset, it should be understood that this is a subject on which even "experts" disagree. Therefore I shall look forward to receiving from my readers expressions of their views, which will be answered either in this journal or by letter.


INSTITUTE OF INCORPORATED PRACTITIONERS IN ADVERTISING

CERTIFICATE OF MEMBERSHIP AS REGISTERED PRACTITIONERS

No :+

This is to Certify that ... whose place of business is at ... are Members of the Institute of Registered Practitioners in Advertising

Given under the Common Seal of the Institute of Incorporated Practitioners in Advertising this ... day of January 1931

President

Vice-President

Secretary

For over thirty years I have been engaged in publicity, helping manufacturers to sell their wares by the aid of the Press, posters, and propaganda. During this time I have been amazed to find how few manufacturers appear to possess sound ideas of allocating their yearly publicity expenditure, if, indeed, they have decided on a yearly appropriation at all. The majority, in fact, still do not employ such a system, but book a contract here, a page there, and issue an occasional booklet in haphazard fashion, though, when it comes to be considered, a manufacturer's expenditure on publicity is just as important as his sales. Obviously, all his expenditure on the former is designed to help the latter, but, and here is the queer thing, he seldom can say with any certainty how much he is spending on this head and where and how it is being spent, though the same man will have the daily sales figures at his finger-tips and knows the weekly percentage cost of every traveller.

How Much do You Spend?

The practice of employing an advertising manager and/or an advertising agent is growing rapidly, but the type of manufacturer described above is very far from extinct; his name is legion and he is most often to be found among those who think thus: "About £500 or £1,000 is all I spend on publicity in the course of a year and such an amount is hardly worth while troubling over." In actual fact, investigation will usually show the real figures to be three or four times larger than those given, the explanation being that so many publicity items are debited in the ledgers under such headings as "Exhibitions," "Bill-posting," "Booklets," etc. In one case, one department of a firm was found to be debiting its pamphlets under the heading of booklets, as noted above, while the next department attributed them merely to "Advertising," while neither considered them a part of the *publicity* account.

When a final audit was made of all these items, the sum involved was found to be nearly double the allocated sum, and sales percentage figures suffered badly. It is really quite an easy matter to estimate fairly accurately for a year's expenditure on publicity, if it is insisted that all such matters should be taken into account, and it is also wise to arrange for the "publicity year" to run concurrently with the financial year.

Many have difficulty in realising that, excellent manufacturers though they are, their capabilities as advertising agents are just the reverse; common sense should tell them that they cannot possibly possess the same knowledge of the matter as the agent whose profession it is, any more than the latter is likely to have a knowledge of all the technical details and trade secrets of the manufacturer. All this notwithstanding, many firms go fondly on, believing that they know all that is to be known about advertising, a delusion which, incidentally, no professional agent himself would ever cherish.

Choosing Your Agent.

Now, after the manufacturer has been brought to see the error of his ways, how is he to choose his agent? Regard the problem much in the same light as engaging a new salesman, but bear in mind the different service the agent will perform. Here are some of the principal points:

1. Is the agent capable of entering into the mind of the buyer?

2. Is he keen on advertising and enthusiastic on his client's behalf?

3. Granted that he is both the above, can he present your problem to produce sales?

4. Who are his other clients? If they demand too much of his time will your product have to take second place?

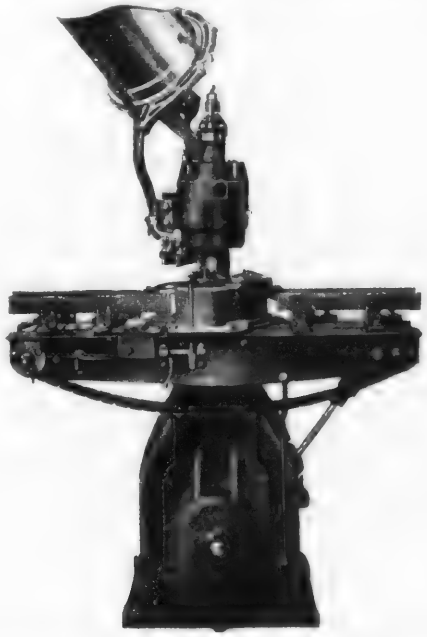
5. See that the "contract" man—*i.e.*, the liaison

(*Continued on page* 53.)

Closures for Glass Containers (*continued from page 37.*)

often as required without difficulty or injury to the cork.

Screw and crown caps require some form of liner to complete the seal. Cork, waxed paper, oiled paper, and metal foils are frequently used for this purpose, but all except the first named require some form of backing to provide the necessary resiliency. Composition and natural cork may be used where the contents are such as not to have any effect on either the cork itself or the binding medium. Where this is not the case a protective layer is provided. Wax paper is used when the product will not affect it.



Fully Automatic A.C. Machine for "R.O." or "Goldy" Seals working at 60 per minute.

an oil paper for products such as mayonnaise, a special black paper to resist alkaline substances, and tinfoil where the product does not attack this metal.

From the foregoing it will be seen that no one type of closure can be expected to give perfectly satisfactory service on each and every type of container. For each type of service there is always a form of closure best adapted, and the expenditure of a little time and trouble in ascertaining which this is is always well repaid.

Mixtured Butter and Margarine

The General Netherlands Dairy Association has applied to the Agricultural Minister with the request that action be taken against the practice of mixing butter and margarine and putting this mixture on the market under the name of "Butterine." The Dairy Association bases its request on the fact that such butterine is often sold in a packing similar to that of butter, and by which the general public is easily led to believe that it is buying butter, whereas the product sold sometimes consists of at least 85 per cent. margarine.

Correspondence

LITHOGRAPHED CANS, AND PROCESSED PACKS

To the Editor.

DEAR SIR,

At the recent Canners' Convention in Leicester, one speaker asked if there was any serious difficulty attached to the use of lithographed cans by packers, and a number of statements were made in reply, each giving some viewpoint more or less touching on the subject.

There are many factors to be considered, and the purpose of this letter is to show that lithographed cans are not a feasible proposition for any processed pack. I'll throw my cap into the ring so that others with divergent opinions may take it up.

There is, to commence with, the cost of any lithographed can. The special printing machines, varnishers, and drying tunnels or ovens, coupled with the cost of handling tinplate, make the cost per label (if one may call it that) higher than the cost of a varnished paper label. Higher costs must immediately act as a deterrent.

Should the tinplate printer be able to print even as cheaply as the paper printer, the can maker would immediately be up against higher costs in handling and body making. The printed body blanks would require more exact trimming than those made from plain tinplate, since the difference of a line-width would upset the appearance of the side seam. Having trimmed with all the greater accuracy necessary, he is faced with one of his biggest problems. There is no gang-slitter made by man which does not leave a burr at the trimmed edge. This burr is kept down to a minimum by all intelligent can makers, but even if they maintain a standard of ·002 inch maximum allowance for burr, there is an insuperable difficulty in preventing scraping or scratching when the trimmed bodies go through the body maker.

No amount of care will eliminate this scratching, though great care will minimise it. My own experience has proved that this reduction of scratching is best done by means of a liberal flow of suitable emulsion applied to the various parts of the body maker. Many emulsions are available, but the very greatest care is called for in their selection, since grease or oil tends to prevent proper fluxing and soldering. If these two items fall below a certain standard the cans will leak just as surely as day follows night.

In order to obtain good soldering without unsightly blistering of varnish, it is necessary to leave a considerable gap at the side seam, showing the unprinted and unvarnished tinplate there. This gap can be reduced by using a three-roll solderer on the body-making machine, where the diameter of the operating roll is approximately $1\frac{3}{4}$ inches, but the use of such pots is very far from being universal. Another method would be to form the bodies pear-shaped, with an internal soldering iron, though this method again is too far out of the common to be regarded as available to every packer.

Having reduced the scratching to the irreducible minimum, the can maker finds that the varnish coating has been so affected that hot water can get at, and discolour, the inks below the surface. Pasteurising varnish will ease matters a little; but, whatever steps are taken, one can never hope to get as good-looking a pack as when a high grade varnished paper label is used. The multitude of scratches gives a dull and unappetising appearance to the can, and rust too often makes its appearance.

It may entail an extra job to label a pack, but, with care in the selection of the labeller and the adhesives, there is very little difficulty, especially if the packer takes the trouble to see that there is no chemical action between the adhesive and the paper on which his labels are printed.

The foregoing statements, all of which are based on actual experience, may help someone to decide against using lithographed cans for his pack. And I think he will be quite right in so deciding, at least for a time.

A. A. MAYTHAM.

Messrs. Dewey and Almey,
Edmonton, N. 18.

Book Reviews

Cake Manufacture and Small Goods Production. By E. B. Bennion and J. Stewart. xiii+185 pp. Leonard Hill, Ltd. 1930. 15s. net.

Cake-making is both an art and a craft and requires the taste of the artist coupled with the skill of the craftsman. It is a branch of baking that requires great skill, patience, exactness, and artistic sense, together with a thorough and intimate knowledge of many raw materials. The baker of bread has only flour and yeast to consider, and once he has grasped the principles of fermentation, dough handling, and oven control, his task is relatively simple. The cake-maker, on the other hand, must know about many raw materials of varying type and quality. He is constantly being brought into contact with substitutes which are offered to him in glowing terms and at alluring prices, and must satisfy himself as to their usefulness before he includes them in his recipes. He has to use different kinds of flour for different purposes. Strong and weak flours are more than mere terms to him. The baker who can make a successful bun and at the same time turn out a delicious Swiss roll must know much of the quality of flour in relation to questions of strength.

There have been many recipe books on cake-making, but most people who have essayed the intricate path of confectionery realise that a mere recipe means little, it is the underlying principle that counts. The baker who understands the fundamental principles of his craft has a shrewd idea as to what is the matter if his recipe goes wrong, but the blind follower of a recipe is lost. Hence the great need for a reliable textbook for the student of cake-making which is based on first principles and sound scientific data, which deals with underlying facts and expresses in simple language the foundations of the craft. Messrs. Bennion and Stewart have written their book with this end in view, and their efforts have been well rewarded. The work should prove of great value to all in the confectionery and small goods business, but especially to the students who are seeking to make cake manufacture a more concise scientific process than has hitherto been the case.

The book can be regarded as made up of two sections (although the authors do not so divide it): (1) The study of the raw materials; (2) the actual manipulative processes of cake-making. Practically the whole of the first fourteen chapters (124 pp.) are concerned with raw materials and basic principles. The last four (60 pp.) deal with cake-making processes, the baking of confectionery goods, the preparations of icings, fondants, etc., and the various types of machinery used. In the first section the raw materials, flour, water, milk, eggs, fats, sugars, baking powders, flavourings, spices, colouring matters, nuts, and fruits are dealt with adequately.

If one might make a slight criticism, it is that rather more details of sugar-making are given than are actually required by the cake-maker and, on the other hand, too little attention is devoted to the types of flour used. More might have been said to enable the confectioner to decide for himself whether the flour he was using was of the right strength. A little more about gluten and its properties and the method of washing it would have been useful. As to the cake-making side of the book little can be said but in praise. The authors are recognised experts (the reviewer has witnessed on more than one occasion the manipulative skill of one of them), and they have given in a concise and logical way recipes and processes for all types of cakes with which the average confectioner will have to deal. The chapter on chemical aeration is very thoroughly dealt with, and while one cannot agree with it *in toto*, it undoubtedly forms an admirable basis upon which the student can build his own knowledge of aerating agents.

The book is excellently produced, very clearly printed on art paper, and the twenty-two illustrations are very distinctly reproduced. The fewness of errors gives evidence both of careful writing and of proof reading. Altogether it is a book no confectioner should be without. It is a mine of valuable information sold at a very moderate price.

T. H. FAIRBROTHER.

The Physical Science of Flour Milling. By E. D. Simon. Liverpool: Northern Publishing Co. 222 pp. 1930. 10s. 6d.

In the preface to this volume the author states: "There seems to be no book in any country which attempts to deal with the principles of flour milling engineering—that is to say, with the physical science underlying the design of the machinery necessary to clean the wheat berry and to split it up into the desired products. This book is an attempt to fill the gap." Everyone connected with the milling industry will be in entire agreement with these remarks. For an industry which is so highly developed from a mechanical point of view it is indeed astonishing that so little has been written of the engineering problems underlying the various milling processes. The miller to-day is largely in the hands of the milling engineer, and, as there seems to be little reciprocity of ideas or continuity of thought amongst milling engineers, the position is somewhat confused.

The book just published by Mr. E. D. Simon—the head of one of the biggest firms of milling engineers in the world makes no claim to be a complete treatise on milling engineering. It is suggestive rather than an encyclopædia, and there is not a single chapter out of the eleven which comprise the book which does not provide the miller with mental grist. The early chapters deal with separations according to dimensions and air currents, and, naturally, this leads to the problem of dust collection, an important process, particularly from the point of view of dust explosions. The author's views on conditioning are well known to the milling industry, as he has never hesitated to place his ideas fully at the disposal of the trade. After discussing the scientific data of the subject, he passes on to the practical problem. In this connection, Mr. Simon has a distinct preference for the radiator system, in which the wheat is heated by contact with hot surfaces, air being supplied as and when required to carry moisture. This is only to be expected, as the radiator conditioner is the one specially made and recommended by his own firm. Whilst one may not agree with the conclusions drawn as to the relative advantages of the various methods of conditioning, one must agree that the author has dealt with the subject in a very unbiassed manner, and has given straightforward descriptions. Conditioning is a subject very little understood. The changes which take place are obscure, and probably include chemical and biochemical changes as well as alterations in physical structure. The main objection to the method of heating by hot surfaces is the danger of overheating some of the wheat and the fact that heat transference must take place from berry to berry, and wheat is a very bad conductor, and in this respect the hot air closed circuit method seems to possess distinct advantages.

One of the most interesting chapters is chapter viii., which deals with the important question of bran powder. The problem of the miller is to make as much pure flour as he can containing the lowest possible amount of bran powder. The examination of the various stocks for bran powder is undoubtedly one of the best methods for controlling the purity of the flour produced, and Mr. Simon's views on this subject are very illuminating. In chapters vii. and viii. it is shown how and at what parts of the mill flow the unforgivable sin of the production of bran powder is committed.

As pointed out previously, the whole of the book is suggestive and even provocative, and endless discussions could be started from almost any point. Its value to the milling industry is incalculable, and the industry is indeed fortunate in having such an authoritative work placed at its disposal by such an eminent man. The book is clearly printed, and there are several useful appendices. It is a pity, however, that there is no index.

T. H. F.

Trade News

Canned Peas Wanted in France.

The pea crop in the North of France was short last year because of unusually destructive winds and rain, and there will, consequently, be a market for imported canned peas. The production of the canneries of this region was about 59,000 cases of 50 cans each in 1929, but the 1930 production did not exceed 48,000 cases, a reduction of about 20 per cent. Roughly speaking, there is a yearly market for 100,000 cases of canned peas in the North of France. Brittany usually supplies about one-third of this amount in the finer grade peas, the remaining two-thirds, in coarser grades, being canned in this region, largely in and near Dunkirk. Canadian peas are already being quoted at Dunkirk, and two years ago, under similar conditions, Canadian peas found a considerable market and were much appreciated. The Nos. 2 and 3 grades should find the best market. It is improbable that there will be any demand for the imported article in the finer grades. The Canadian peas, No. 2 grade, are being quoted at wholesale, c.i.f. Dunkirk, 3·20 francs per can (12·5 cents). The local peas sell for 4·10 francs, or a little over 8d. per can ex factory.

* * *

Lecithin.

"Bloom," one of the chocolate manufacturer's most insistent troubles, has recently been found to yield to treatment with lecithin, the addition of which in small quantities to cacao-butter causes it to behave as if it were a single compound fat and to crystallise homogeneously. Thus the deposition on the surface of the chocolate crystals of those lower melting fats is avoided and "bloom" cannot occur. Also, it has been found that the addition of lecithin results in an increase of fluidity, which enables a reduction to be made in the amount of cacao-butter added to ensure a smooth working coating.

* * *

Messrs. A. Boake, Roberts and Co., Ltd., have recently introduced "Collabrac," a compound containing from 60 to 65 per cent. lecithin (estimated as egg lecithin). The makers state that it is prepared in such a manner that all objectionable fractions have been removed and it cannot become rancid through keeping, and no rancidity can develop in the finished chocolate. There are, it is claimed, no free low melting fats present in "Collabrac," and the separation which occurs in some commercial preparations is avoided, thus giving a homogeneous product of uniform composition.

Blackening of Pickled Onions.

One of the troubles which the maker of pickles sometimes meets is a tendency for the onions, after having been packed and kept in stock for a month or so, to become black and discoloured at the ends. This seems particularly frequent with onions which have not been properly brined, or with crops which have been grown with the aid of certain types of fertilisers. The actual blackening has been attributed by some packers to the type of caramel used in colouring of the malt vinegar, which interacts with certain of the juices contained in the onions. Messrs. L. Lambert and Co., Ltd., have sent us a copy of a pamphlet recently issued by them in connection with this matter, setting forth the advantages of their "P" caramel, which, they claim, when used with any type or crop of onions, will not stain them in any way, but will leave them perfectly white and bright in appearance, no matter whether the onions are brined or not and regardless of the way in which they have been peeled. Interested readers may obtain trial samples of this caramel on application.

* * *

Canned Fish Market in Marseilles.

Portuguese sardines maintain their usual supremacy on the local market, with Algeria, Spain, and Morocco furnishing nominal amounts; 1,849 short tons having been imported from Portugal during the first nine months of 1930, according to figures furnished by the local Chamber of Commerce. The other three sources combined furnished about 495 short tons. Attempts to introduce Italian sardines, which were of poor quality, on the local market met with failure. Those furnished by Morocco are also of an inferior quality. Prices of Portuguese sardines have remained practically unchanged since January 1, 1930. Although American pilchards have enjoyed regular sales, the volume has not grown to the extent expected a year ago. They constitute an article which comes into more or less direct competition with sardines, and there is good reason to believe that they will continue to enjoy good sales. However, serious competition from Canada and Japan in this regard is being felt due to considerably lower Customs duties to which the products of these two countries are subjected.

* * *

Canadian salmon, up to the present practically without competition on the local market, is vying for first place with Japanese salmon. Japanese dealers, having quoted prices for the present season two months in advance of Canada, are estimated to have received orders for about 70 per cent. of the probable total of business in this line. Held over stocks of salmon are stated to be responsible for the feeble tone of the market, 1,000 cases being a probable total of the amount held over in warehouses from the previous season. Tuna-fish constitutes one of the items of importance of actual French origin. It is the one article for which a rising price has been noted, the price having increased 10 or 12 per cent. during the last six months. The percentage of the supply coming from the Mediterranean is fairly unimportant when compared with the amount caught along the French Atlantic coast. Although American firms have attempted to sell tinned Californian tuna locally, they have thus far met with little or no success. The sales of tinned lobster and crayfish, particularly of the latter, to the Marseilles public have increased considerably during the past few years. During the past year, however, the market has been glutted, with the result that approximately 300 cases have been held over from last season.

* * *

Dehydration of Fruits.

The Chilean Ministry of Agriculture has recently installed in the Department of Elqui an experimental plant for the dehydration of fruit, according to information submitted to the Department of Commerce in a report dated November 8 from Acting Commercial Attaché Harold M. Randall at Santiago, Chile. This plant is reported to have a daily capacity of about 2,000 tons of fresh fruit, and can be enlarged if necessary. It is to be similar to the system previously established by La Fabrica de Conservas y Frutas Secas of the Quintal Normal, a Government institution, and, with the modern equipment installed, the new plant hopes to manufacture this product on a large scale.

* * *

New Jamaican Food Regulations.

An amendment to section 16 of the Jamaican Adulteration Law, 1908, adds "colouring matter or other ingredient or material," in respect of which the Governor in Council may make regulation to limit their quantity or prohibit their use in foods, states American Consul Paul C. Squire at Kingston in a report forwarded to the Department of Commerce under date of November 4. Under the provisions of the Adulteration Law, 1908, as amended, the Governor in Privy Council has made regulations, effective

January 1, 1931, governing the use of preservatives and colouring matter in foods, which, except for special application to Jamaica, are identical with the Public Health (Preservatives) Regulations, 1925 (as amended by regulations 1926 and 1927), in force in the United Kingdom.

* * *

Condensed Milk in Iraq.

On October 10, 1930, Food Regulation No. 26 of 1930 was published in the Iraq Government Gazette, and became effective the same day. The measure defines adulteration and preservatives, prescribes permitted preservatives and standards for certain dairy produce, including condensed milk. Standards of other articles of food are to be defined by the Director of Public Health in a special notification.

* * *

The National Diet.

Two lectures on "The National Diet" will be given at the London School of Hygiene and Tropical Medicine, Gower Street, W.C. 1, by Professor E. P. Cathcart, C.B.E., F.R.S., at 6 p.m. on Monday and Tuesday, February 23 and 24 next. Lecture I. will cover the following matter: General problem; two phases to be considered; qualitative and quantitative; balance of metabolism; anabolism and catabolism; "Stoffwechsel" and "Kraftwechsel"; qualitative phase; composition of diet; protein, fat, carbohydrate; salts; accessory substances; water; habits; tastes; and idiosyncrasies. The second with the quantitative phase; evaluation of needs; determining factors; methods of investigation; individual and collective; man value and family coefficients; difficulties of assessment; content of protein, fat, and carbohydrate; calories as units of measurement; total calorie content; percentage distribution of calories; criteria of an adequate diet. Both lectures will be illustrated with lantern slides, and admission is free, without ticket.

* * *

Coffee without Tears.

A machine which, it is claimed, makes the production of anything but perfect coffee practically impossible, was demonstrated by the Express Coffee Company at the Café Royal, Regent Street, last month. It consists of a water heater and steam raising unit, something after the style of an ordinary geyser, fitted with a number of projecting arms. Each arm terminates in a small container which holds the ground coffee and which is fitted with one, two, or more spouts discharging into the coffee cups, which are placed on an adjustable stand below. By the opening of a two-way valve, steam and hot water are alternately admitted to the ground coffee, the resultant infusion draining down through the spouts into the cups. It is claimed that all the flavour and essence is extracted from the coffee by this method, and that the resultant beverage is hot, aromatic, clear, and free from sediment. One part of the machine is a dry steam heater, which raises milk to boiling-point in a few seconds. Thus milk required for coffee can be kept cool and fresh up to within a few seconds of its being served. The capacity of the Express machines varies from 30 to 2,800 cups per hour, according to size, and 42 of the machines have just been installed on the *Bremen* and 39 on the *Europa*.

* * *

Food Finance.

According to the very useful annual list compiled by Messrs. Jordan and Sons, Ltd., thirteen new public companies, engaged in the food industries, were registered last year, with a total capital of £699,700. These figures were exceeded by private companies, similarly engaged, which numbered 635, with a total capital of £4,698,475. The largest individual company registered in this field, from the point of view of capital, was Associated Canners, Ltd., with £1,650,000.

* * *

Canadian Jams Too Sweet?

In view of recent events in our own jam industry, the results of a recent survey of the Canadian jam trade should be of interest. It is said that the grocery trade are buying pure jam in a somewhat disappointing volume. Practically all of the business in recent months has been in the fruit juice or pectin jams, which seems to confirm the doubt which was expressed at the time the Canadian Government established the new jam standards last year as to whether the consumption of pure jams would increase. The new standards insist that pure strawberry jam shall contain 55 per cent. fruit and 45 per cent. sugar, and others 50 per cent. of each, with no added ingredient. The Canadian consumers are said to be finding this jam too sweet for their palates, and they are turning it down in favour of the so-called "compound" which contains pectin.

* * *

Of course, the price is higher, and "this," *Canadian Grocer* thinks, "may be an additional reason for slow sales." Another is the fact that some of the large buyers are still taking on old contracts jams made prior to the enforcement of the regulations, and until these have been disposed of they will not be in the market for the newest products. In face of all this, it is the opinion of both Canadian jam manufacturers and the retailers that the consumer is not going to take to the new standard quality pure jam for the reasons above mentioned. "The general opinion among jam men and retailers is that the public will buy the pectin jams even though the labels show that they contain fruit juices and pectin. Consumers are getting used to pectin in their jam because they like it, and, in the nature of things, they will buy that which suits them best."

* * *

The Regulations.

The Canadian official regulations are as follows:

Pure strawberry jam must contain 55 per cent. fruit and 45 per cent. sugar.

Other pure jams and marmalades must contain not less than 50 per cent. fruit and 50 per cent. sugar.

Strawberry jam with pectin or fruit juice added shall contain not less than 32 per cent. strawberries. Labels must show additional constituents.

Other jams with pectin shall contain not less than 27 per cent. fruit.

Blended jam including two or more kinds of fruit, one of which is strawberry, plus pectin, shall contain not less than 15 per cent. strawberry.

Other jams containing two or more fruits shall contain not less than 12½ per cent. of the most expensive fruit named on the label.

* * *

Canning Equipment Duty Free in British Honduras.

An order in council by the Governor of British Honduras exempts from duty for three years from November 1, 1930, imports of tin cans and covers, sealing machines, including accessories and parts thereof, glass jars, caps and gaskets, labels and cartons intended to be used in connection with the canning and bottling of fruits and vegetables. Formerly the British Honduras import duties on these articles were 20 per cent. *ad valorem* under the general tariff, applying to shipments from other than British countries, and 10 per cent. *ad valorem* under the British preferential.

* * *

Food at the British Industries Fair.

The food, beverage, and tobacco section of the British Industries Fair this year will be accommodated on the ground floor of the Grand Hall at Olympia. In all, 14,000 sq. ft. will be occupied by the exhibitors, among whom will be Messrs. Ahrens, Ltd., London; Anglo-Rhodesian Tobacco Co., Ltd., London; Automatic Confections, Ltd., London; Automatic Machine Co., Ltd., Wembley, Middx.; Bantam Products, Ltd., London; Beaufoy, Grimble and Co., Ltd., London; Bemax Sales, Ltd., London; British Booklet Matches (1928) Ltd., London; British Can Co., Ltd., London; British Canners, Ltd., London; Burton Holt (Chelsea), Ltd., London; Cadbury Bros., Ltd., Birmingham; Caldicot Tin Stamping Works, Ltd., Caldicot, Mon.; Chivers and Sons, Ltd., Histon, Cambridge; Chocolate

Products Co., Ltd., London; Cliftons Chocolates, Ltd., Manchester; Cluse, Ltd., London; Consol Products, Ltd., Sunbury Common, Middx.; Frank Cooper, Ltd., Oxford; Cow and Gate, Ltd., London; G. T. Culpitt and Son, London; Adolph Frankau and Co. (1927), Ltd., London; R. J. Fullwood and Bland, London; Wm. Gaymer and Son, Ltd., Attleborough; H. J. Green and Co., Ltd., London; H.P. Sauce, Ltd., Birmingham; Geo. Kemp, Ltd., London; Keystone Knitting Mills (1928), Ltd., Elstree, Herts.; John Mackintosh and Sons, Ltd., Halifax; Makedon Tobacco Co., Ltd., London; Metal Box and Ptg. Industries, Ltd., London; Oxford's, Pudding Manufacturers, Burton-on-Trent; Packs (1925), Ltd., Feltham, Middx.; Peerless Electrical Manufacturing Co., Ltd., London; Henry Pooley and Son, Ltd., Birmingham; Purnell and Panter, Ltd., Bristol; A. Romany and Co., Ltd., Tunbridge Wells; Scoffin and Willmott, Ltd., London; G. Sheldrake, London; Smith's Potato Crisps (1929), Ltd., Brentford, Middx.; Staines Kitchen Equipment Co., Ltd., London; Stevenson and Williams, Ltd., Brierley Hill, Staffs.; Truman, Hanbury, Buxton and Co., Ltd., London; Turner and Son, Ltd., Nottingham; Virol, Ltd., London; Walter's "Palm" Toffee, Ltd., London.

* * *

Italian Duty on Salmon.

A recent Italian decree, effective at once, imposes a duty on canned salmon, which formerly was free of duty when entering that country. The duty on salmon in tins weighing not over ½ kilo (including the tin) is 35 gold lire per 100 kilos, or practically 2d. per pound. The duty on salmon in tins weighing over ½ kilo but not over 1 kilo is 30 lire per 100 kilos, or 1½d. per pound. A kilo is equivalent to 2·2 pounds.

* * *

Hawaiian Citric Acid Plant.

For the purpose of using by-products from pineapple juice, from which is obtained citric acid, the Hawaiian Pineapple Company is erecting a new plant at Honolulu, which it hopes will eventually become one of the largest citric acid plants in the world. In manufacturing citric acid, a waste from pineapple juice, which has been more or less of a problem in the past, is eliminated. The company is already making some citric acid in Honolulu, but is putting up the new plant for the purpose of crystallising it, that being the form in which it is put on the market. The new plant has cost about £50,000, and was expected to be in operation by December 1, 1930.

Publicity (*continued from page 48.*)

between agent and advertiser—is a man to the liking of yourself and your board.

6. See that the agency man, your advertising manager, and your sales manager can, do, and will co-operate.

7. Choose an agent who does not always agree with you. A real agent will not always let you do what you want to do, but what he knows is best.

8. Ask your fellow manufacturers who employ an agent for their opinion of him and why they employ him.

9. Finally, think well and long before making your choice.

The agent who specialises in technical, mechanical, and engineering products is also quite capable of organising a national campaign for beer, food, or cigarettes, and his specialised knowledge will make him doubly valuable to the manufacturer. That the yearly expenditure is small is no reason why an agent should not be appointed. The real honest-to-God agent welcomes the small spender, looking to the future, for he knows that as he helps his client to grow so will he increase his own remuneration, and this, in itself, is sufficient inducement for the sincere man. Possibly, he will be out of pocket (from a point of view of time spent in giving the numerous minor uncharged-for services), but he is content to reap the benefit later.

Factory-Packing the Food Product (*continued from page 45*).

For filling semi-solid and viscous products, certain factors must be observed. Accuracy as to amounts of product must be maintained; air pockets cannot be tolerated in some products; uniform mixture of solids and liquids must be held in some instances; and the texture of the material to be filled cannot be allowed to change. The most satisfactory speed for filling containers with viscous material is sixty per minute. There are, generally speaking, two types of machines for this sort of filling—piston and rotary gear—both of which are more dependable and positive than gravity fillers.

Labelling.

No container can be considered complete until it has been provided with its label. In some cases, particularly with convolute fibre cans, the label is printed separately and affixed to the container in a special labelling machine. This system has its advantages, but it is more usual, especially with the types of light folding carton previously described, for the printing to be done direct on the material of the container. The temptation to crowd in too much matter in description of the contents should be resisted, and some simple message chosen which will "stick" and produce as intense an effect as possible. Primary, contrasting colours are best because of their brilliance, and the printing plates should be sharp and deeply etched so that lines and letters will have a clean appearance, while a slightly glazed appearance on the label is advantageous, as it avoids the "aged" appearance given by dead, flat and dull surfaces.

An investigation by the Dartnell Corporation of America into the way manufacturers apportion their advertising expenditure shows that food products manufacturers spend 13·9 per cent. on folders, 10·7 per cent. on catalogues, 16·3 per cent. on window displays, 4·1 on postage, and 55 per cent. on other forms of advertising.

* * *

An unusually artistic calendar is being distributed this year to their friends by Messrs. Oury Millar and Co., Ltd., the well-known glue and gelatine manufacturers. It takes the form of a portrait, reproduced in colour on silk, of a very attractive young lady, immediately beneath which is a neat date block, while, in order not to mar the effect of the whole, the firm's name is inconspicuously inscribed in one corner.

The Dietetic Value of Gelatine

By PAUL I. SMITH,
Author of "Glue and Gelatine."

The importance of gelatine in modern dietetics is now generally recognised by medical specialists and bio-chemists.

IN ATTEMPTING to give a brief résumé of the reasons why gelatine is a beneficial addition to special and common dietaries, one is forced to treat the subject sectionally.

1. By nature of its protective colloidal and emulstatic effects, gelatine assists in the digestion of heavy and difficult foods. In the usual course of events, when milk or cream enters the stomach the casein is at once coagulated by the hydrochloric acid and rennin in the gastric juices. The fats also are carried down by the casein flocks, and they tend to render the latter tough, leathery, and difficult to digest. It should be remembered that unless these curds are completely dissolved by the stomach and intestinal juices their food value is nil, as they pass practically unchanged into the intestines. Yet, in order to effect their complete digestion, considerable energy must be needlessly expended.

In the presence of gelatine the coagulation of the milk casein is prevented or at least controlled—that is, the flocks of casein become loose and comparatively easy to break down.

T. B. Downey, in an interesting paper, *New Facts about Edible Gelatine in Ice-Cream*, published by the Mellon Institute of Industrial Research, notes that, in addition to the property of controlling the curdling of milk casein, gelatine is a "peptogenic substance—that is, one which increases the flow of gastric juices. When the food is passed from the stomach into the intestines, the gelatine remaining as such aids the pancreatic juices by keeping the fats in the finally divided emulsified condition. In the intestine the digestion of food is completed and the nutritive portions pass through the intestinal walls into the blood-stream." The importance of protective colloids in dietetics is now recognised by the medical profession.

Clinical experience has successfully demonstrated the fact that gelatine is a very satisfactory "protective colloid," and exerts a beneficial effect when added to milk and other foods.

2. By the addition of gelatine to confectionery, cereal preparations, and ice-cream it is possible to render them nutritious and of genuine food value. In marshmallows, nougat, fudge, fruit jellies, and many similar products gelatine is used to a large extent. Apart from the useful part this protein plays in the actual construction of the confectionery, its increase of the food value is most significant and important.

Drs. Hosoi, Alvarez, and Mann of the Mago Clinic, in the *Archives of Internal Medicine*, give the following figures showing the percentage of indigestible matter remaining after feeding with various substances:

	Per Cent. of Moist Residue.	*Per Cent. of Dry Residue.*
Gelatine	4·7	3·4
Corn sugar, 33 per cent. ...	10·5	1·7
Cane sugar, 50 per cent. ...	11·0	3·2
Meat	16·6	12·5
Tomatoes	31·3	14·6
Bread	47·2	9·3
Egg albumen	56·5	85·9
Bananas	111·97	32·7

The experiments of Osborne and Mendel have shown that gelatine is of great value when incorporated with cereal preparations. Although gelatine is an incomplete protein—that is, it lacks the presence of some essential amino acids such as tryptophane, tyrosine, and oxyglutamic acid—it may be added to other incomplete proteins lacking some of the constituent amino acids of gelatine. Again, gelatine may be added to incomplete proteins or foods deficient in lysine and proline which appear to be essential to growth. There are several important cereal proteins, such as zein from corn and hordein from barley, which give no lysine on hydrolysis. Now, the addition of a small percentage of gelatine to the above has been proved to increase their food value very appreciably. McCollum found that whereas a synthetic food containing 9 per cent. oat protein and the suitable proportions of salts and vitamins supported growth at half normal, the addition of 10 per cent. gelatine rendered the growth curve quite normal.

Numerous feeding experiments have been conducted by bio-chemists on McCollum's lines, and these have accumulated evidence in favour of the addition of gelatine to cereal grains, such as whole rye, pearled barley, and whole barley.

The mechanism of the action of lysine and proline in stimulating the growth of an organism is not understood, but their action is well defined. Histidine and arginine are also important factors in human metabolism, and these are present in the hydrolytic products of gelatine.

Referring again to ice-cream, it was thought some years ago that the presence of gelatine in ice-cream was undesirable, as it acted only as a filler and adulterant. Now manufacturers realise that gelatine gives ice-cream a genuine food value on account of its protective colloidal nature and its own protein growth stimulating properties.

Financial News

The Editor cannot accept responsibility for any errors which may appear in the Financial News Section.

BANK RATE (1930)

February 6	4½ per cent.
March 6	4 ,, ,,
March 20	3½ ,, ,,
May 1	3 ,, ,,

Having regard to the action of the committee of shareholders of the **Aerated Bread Company, Ltd.**, which recently issued a circular asking for support in advancing proposals regarding the management, the company's accounts covering the financial year to September 30 last are of special interest. Compared with £46,699 for the previous twelve months, the gross profit amounted to £154,899, the turnover being the highest in the record of the company, and other income brought in £20,270, giving a total of £175,169. Against this has been debited depreciation £66,737, income-tax provision £25,000, and directors' fees £4,104, so that the net profit was £79,328, which compares with £16,241 realised in 1928-1929, enabling a dividend of 5 per cent. to be paid on the ordinary share capital. The following is a summary of the final appropriation figures :

	£	£
Brought forward from 1928-1929	15,550	
Net Profit—year ended September 30, 1930	79,328	
Disposable Balance	£94,878	
6½% dividend on £500,000 Cumulative Preference £1 Shares		25,594
5% dividend on £1,250,000 Ordinary £1 Shares	62,500	
Less tax at 4s. 6d. in the £ ...	14,063	
		48,437
Carried forward to 1930-1931		20,847
		£94,878

The principal assets and liabilities as shown on the company's balance sheet are enumerated below :

	Sept. 30, 1930.
	£
Freehold and Leasehold Property	1,055,025
Plant and Machinery	483,786
Shares in Subsidiaries	333,429
Stocks and Stores	63,967
Debtors	22,970
Cash	5,979
Bank Loan	49,698
Trade Creditors, etc.	181,979

During the year £54,179 expended on improvements and repairs was debited to profit and loss.

The report of **East India Distilleries and Sugar Factories, Ltd.**, covering the year to September 30 last, discloses a net profit of £22,349, which contrasts with £35,515 realised during the previous twelve months. The company was registered in 1897 for the purpose of acquiring certain businesses and properties in Madras, and the authorised share capital is now £280,000, all of which has been issued and paid up in the form of £200,000 7 per cent. cumulative preference £1 shares and £80,000 ordinary shares of 16s. each, fully paid. In 1928-1929 a dividend of 13¾ per cent. was paid on the ordinary shares and 8½ per cent. on the preference shares, and, after allocating an additional £10,000 to depreciation, the sum of £6,458 was carried forward, so that the disposable balance this year is £28,807, necessitating reductions in the dividend rates to 10 per cent. ordinary and 7 per cent. preference, the balance of £6,898 being carried forward to the next appropriation account. The balance standing to the credit of the company's reserve fund is £105,000, representing 37½ per cent. of the total share capital. The preference shares were recently quoted at 17s. 6d., and the 5 per cent. debenture stock at par.

Together with other income, the gross profit realised by **John Mackintosh and Sons, Ltd.**, during the year ended September 30 last amounted to £100,287, which compares with £125,594 in 1928-1929 and with £38,152 in 1927-1928. After charging £11,387 for depreciation and debiting other charges, the net profit for the year was £86,543, to which must be added the sum of £50,064 brought forward from the previous appropriation, giving a disposable balance of £136,607. The company was registered in 1921, and specialises in the manufacture of toffee and other articles of confectionery, the authorised share capital being £750,000, of which £700,000 has been issued and paid up, comprising £300,000 10 per cent. cumulative preference shares of £1, £200,000 20 per cent. cumulative preferred ordinary shares of 10s., and £200,000 deferred ordinary 10s. shares. The appropriation figures are given below :

	£	£
Brought forward from 1928-1929 ...	50,064	
Net Profit—year ended September 30, 1930	86,543	
Disposable Balance	£136,607	
10% dividend on £300,000 Preference Share Capital		30,000
30% dividend on £200,000 Preferred Ordinary Shares (including 10% announced payable on December 31)		60,000
Carried forward to 1930-1931		46,607
		£136,607

According to a statement issued by the directors, business since the balancing date has been very satisfactory. Recently the preferred ordinary shares were quoted at 15s. 5d.

The profits realised by **Callard, Stewart and Watt, Ltd.**, have been well maintained during the financial year ended September 30 last, the gross profit being £49,400 as compared with £48,077 in 1928-1929, and the net profit £32,234 as compared with £36,204. Last year the sum of £4,481, which had been reserved for income-tax, was transferred back to profits, and this explains the apparent reduction of net profit. The reduction of the dividend from 12½ per cent. to 10 per cent. is a matter of expediency rather than of necessity, as the following figures clearly demonstrate :

	£	£
Brought forward from 1928-1929 ...	27,504	
Net Profit—year ended September 30, 1930	32,234	
Disposable Balance	£59,738	
6% dividend on £175,000 Cumulative Preference £1 Shares		10,500
10% dividend on £160,000 Ordinary £1 Shares		16,000
Allocated to Reserve, etc.		18,075
Donation to Employés' Benevolent Fund		500
Carried forward to 1930-1931		14,663
		£59,738

The following are the principal assets and liabilities enumerated on the company's balance sheet dated September 30, 1930 :

	Sept. 30, 1930.
	£
Freehold Property	142,879
Leasehold Property	326,357

Investments in Subsidiaries	100,000
Reserve	70,000
Mortgages	213,227
Bank Loan	40,000
Advances to Subsidiaries	24,469
Debtors	10,709
Stocks	20,200
Cash	13,060
Creditors	50,918
6% Debenture Stock	70,000

At 17s. the preference shares yield over 7 per cent.

An interim dividend of 2½ per cent. has been paid by **R. S. McColl, Ltd.**, manufacturing and retail confectioners, of Glasgow, this being the same rate as the interim dividend paid a year ago. The company was registered in 1925, and the authorised share capital is £350,000 in £1 shares, of which £310,000 has been issued and paid up in the form of £160,000 7½ per cent. cumulative preference and £150,000 ordinary shares. The last accounts were made up to April 25, 1930, and submitted in June, the audited profit and loss account showing a credit balance of £25,555 as compared with a profit of £26,253 for the previous twelve months, which enabled a final dividend of 5 per cent. to be paid, as before, making 7½ per cent. for the year, and another £7,500 to be added to the reserve, leaving £6,501 to be carried forward as against £6,709 brought in. In addition to the Glasgow factory, the company owns some 118 shop premises, including 72 held on lease.

A dividend of 3 per cent. has been announced by the **Acadia Sugar Refining Company, Ltd.**, on the 6 per cent. cumulative preference shares. The company was incorporated in 1926 under the laws of Nova Scotia, and in addition to the sugar refinery at Woodside, Halifax, owns a box and barrel factory and a cooperage plant, the authorised share capital consisting of $1,500,000 (£308,219) common shares of $5 and £1 and $1,500,000 (£308,219) 6 per cent. preference shares of the same denomination, all of which have been issued and paid up. There are also $2,391,900 6 per cent. first mortgage sinking fund gold bonds of $1,000 and $500 outstanding, also $731,370 7 per cent. general mortgage sinking fund gold bonds. The accounts are made up to December 31 each year, and are usually submitted in April, and the report covering 1929 showed that, after debiting $189,369 for depreciation and $183,668 for interest, the net profit was $683. During 1929 some of the bonds were retired.

The profits realised by **Goldsbrough, Mort and Company, Ltd.**, have been adversely affected by the unfavourable conditions which have prevailed in Australia during the last eighteen months, and, although an interim dividend of 1s. per share was paid in December, 1929, no interim payment is being made this year. The authorised share capital is £2,400,000 in shares of £1 each, all of which have now been issued and paid up, and the accounts covering the financial year ended March 31 last revealed a balance of net profit amounting to £209,641 as compared with £338,609 realised during the previous twelve months, necessitating a reduction in the dividend rate from 15 per cent. to 10 per cent. The final appropriation account was made up as follows:

	£	£
Brought forward from 1928-1929 ...	102,960	
Net Profit—year ended March 31, 1930	209,641	
Disposable Balance	£312,601	
10% dividend on £2,000,000 Shares of £1 ...		200,000
Transferred to Reserve, etc.		2,500
Carried forward to 1930-1931		110,101
		£312,601

In November, 1929, one share was issued for every five shares held, bringing the total capital now ranking for dividend up to £2,400,000.

During the year ended October 31 last, **Idris, Ltd.**, manufacturers of mineral water, etc., realised a profit of £17,438 as compared with £17,776 for the previous twelve months. The company was registered in 1893, the name being changed in 1928, and the authorised capital is £216,000, of which £206,000 has been issued and paid up, comprising £110,000 "A" preference shares, £10,000 "B" preference shares, £50,000 "A" ordinary shares, £18,000 "B" ordinary shares, and £18,000 founders' shares, all of £1 each. After adding the sum of £4,526 brought forward from the 1928-1929 appropriation, there was a disposable balance of £21,964, and this amount has been allocated in the following manner:

	£
4% interest on £55,000 Mortgage Debenture Stock	2,200
6% dividend on £110,000 "A" Preference Shares	6,600
7% dividend on £10,000 "B" Preference Shares	700
10% dividend on £50,000 "A" Ordinary Shares	5,000
10% dividend on £18,000 "B" Ordinary Shares	1,800
5% dividend on £18,000 Founders' Shares ...	900
Carried forward to 1930-1931	4,764
	£21,964

The "A" ordinary shares were recently quoted at par and the "A" preference at 15s., while the debenture stock was priced at 62.

A dividend of 3¾ per cent. on the preference shares for the half-year ended December 31, 1928, has been declared by the **Smithfield and Argentine Meat Company, Ltd.** The authorised share capital of the company is £1,500,000, and £1,125,000 has been issued and paid up—viz., £500,000 7½ per cent. cumulative preference £1 shares and £625,000 ordinary £1 shares, while in satisfaction of arrears of preference dividend to December 31, 1927, £280,770 5 per cent. income certificates were issued in January, 1928. In 1927 the loss amounted to £112,738, and in 1928 the loss was £8,957, the balance standing to the debit of profit and loss on December 31, 1928, being £28,093. During 1929 a loss of £1,860 was sustained, bringing the debit balance up to £29,953. The last balance sheet showed the following principal items:

	Dec. 31, 1929.
	£
Creditors	132,867
Bills payable	535,000
Stocks	515,427
Stores	79,231
Debtors	123,125
Cash	50,767

The ordinary shares were recently quoted at 5s. and the preference shares at 16s.

The balance of profit realised by **Cow and Gate, Ltd.**, during the year to September 30 last was £45,399, an increase of £5,068 over the previous year's figure. The company was registered as a private concern in 1909, and was converted into a public company in 1920, the name being changed in 1929, and the authorised share capital is now £550,000, of which £275,000 has been issued and paid up, consisting of £200,000 7½ per cent. cumulative participating preference £1 shares and £75,000 ordinary 1s. shares. As in 1928-1929, the ordinary dividend is 15 per cent., entitling the preference shares to an extra ½ per cent., making 8 per cent., and, after writing off capital reorganisation expenses amounting to £5,069 and allocating £17,000 to reserves, there remains a balance of £6,868 to be carried forward to the next account. The company's general reserve now amounts to £24,000. Recently the ordinary shares were quoted at 4s. and the preference at 22s. 8d.

The decline in the amount of gross profit realised by **Manbré and Garton, Ltd.**, during the financial year which terminated on September 30 last was not so great as might reasonably have been expected, having regard to the conditions in the markets for brewing sugar, flaked maize, corn syrup, and sugar substitutes, and the net profit of £366,920 goes against £410,289 for the previous twelve months. The company was registered in 1919, and the authorised share capital is £1,800,000, of which £1,796,669 has been issued and paid up in the form of £500,000 7 per cent. cumulative preference £1 shares, £1,146,669 ordinary £1 shares, and £150,000 deferred shares of 2s. denomination. The ordinary dividend has been reduced from 17½ per cent. to 16 per cent., and the deferred dividend from 95½ per cent. to 84 per cent., the final figures being balanced in the manner indicated below:

	£
Brought forward from 1928-1929 ...	185,810
Net Profit—year ended September 30, 1930	366,920
Disposable Balance	£552,730

	£
7% Preference Dividend	35,000
16% Ordinary Dividend	183,467
84% Deferred Dividend	126,133
Transferred to Reserve	10,000
Bonus to Staff and Employés (1928-1929) ...	6,155
Carried forward to 1930-1931	191,975
	£552,730

The company's balance sheet shows the following :

	Sept. 30, 1930. £
Creditors	52,153
Owing to Subsidiaries	113,134
Due from Subsidiaries	1,325
Stocks	202,118
Debtors	133,765
Cash	245,587
Investments in Subsidiaries	2,914,540
Other Investments	159,645
General Reserve	1,425,000
Reserve against Investment in Subsidiary Companies	207,696
Depreciation Reserves	136,768

There are no debentures. The ordinary shares were recently quoted at 33s. 6d.

Stock and Share List

	Jan., 1931.	*Par Value.*	*Dec.*, 1930.
Aerated Bread : Ord. ...	18/3	£1	18/6
6½% Pref.	21/3	£1	20/7
Apollinaris : Ord.	6/-	£1	6/-
Assoc. Biscuit : 6½% Pref. ...	23/6	£1	24/3
Avery (W. and T.) : Ord. ...	53/-	£1	53/3
Benger's Food : Ord. ...	30/-	£1	30/-
6% Pref.	4⅞	£5	4⅞
Bovril : Ord.	25/-	£1	24/6
Deferred	36/9	£1	37/6
6% Pref.	23/-	£1	23/3
4½% Deb.	88	£100	89½
British Aluminium : Ord. ...	30/-	£1	33/-
6% Pref.	21/6	£1	21/6
British Thomson Houston : 7% Pref.	23/-	£1	23/11
Bucknall (H.) and Sons. : Ord.	20/-	£5	20/-
Cadbury : 8% 2nd Pref. ...	27/6	£1	28/-
Callard, Stewart and Watt : 6% Pref.	17/-	£1	17/-
Carrs : 6½% Pref.	20/2	£1	20/3
Cerebos : Ord.	6½	£1	6¼
Chivers : 6% Deb.	102	£100	102¼
Cinzano : 7½% Pref. ...	20/9	£1	20/10
Clark's Bread : Ord. ...	22/-	10/-	22/6
Criterion Restaurants : Ord.	6/8	5/-	7/-
Crosse and Blackwell : Ord.	1/9	1/-	1/11
7½% Pref.	11/-	15/-	11/6
6½% Deb.	97	£100	97½
English and Dutch Meat : 8% Deb.	50	£100	49
English Margarine : Pref. ...	23/2	£1	23/-
Foster Clark : Ord.	50/-	10/-	49/-
Fry's : 8% "B" Preferred	22/3	£1	22/-
Fullers : Ord.	33/8	£1	33/9
7% Pref.	18/2	£1	18/-
H.P. Sauce : Ord.	97/6	£1	100/-
Hill (W.) : Ord.	5/-	£1	6/-
Home and Colonial : Ord. .	14/4	4/-	14/3
15% Cum. Ord.	49/5	£1	48/6
6% Cum. Pref.	5 11/16	£5	5 9/16
Holbrooks : Ord.	16/-	5/-	15/6
5% Pref.	4¼	£5	4 1/16
Hovis : 6% Cum. Pref. ...	23/-	£1	23/-
Imperial Chemical : Ord. ...	17/10	£1	19/5
Deferred	5/-	10/-	5/5
7% Cum. Pref.	21/11	£1	23/2
International Tea : Ord. ...	10/3	5/-	10/4
6% 1st Pref.	23/-	£1	22/6
7% "A" Pref.	24/5	£1	24/4
Jones (R. E.) : Ord.	1/6	5/-	1/3
10% Pref.	7/-	£1	6/3
Jurgens : 7% Cum. Partg. Pref....	23/2	£1	25/-
Kia-Ora : Ord.	7/6	10/-	7/9
Liebigs : (Reg.)	14⅜	£5	14⅜
(Bearer)	14½	£5	14½
5% Pref.	99/9	£5	99/9
Lipton : Ord.	4/1	1/-	4/-
5% 1st Pref.	7/6	10/-	7/7
6% Pref.	8/-	10/-	8/1
6% Deb.	99	£100	99½
Lovell and Christmas : Ord.	11/-	£1	12/-
Lyons : Ord.	95/-	£1	97/-
"A" Ord.	92/-	£1	96/2
5% Pref.	20/3	£1	20/6
6% Preferred Ord. ...	22/-	£1	22/-
7% Pref.	26/3	£1	27/-
8% Pref.	29/3	£1	29/7
Mather and Platt : Ord. ...	38/-	£1	37/-
Maypole Dairy : 20% Preferred	16/-	5/-	15/6
Deferred	4/6	2/-	4/7
5% Pref.	19/6	£1	18/11
Meadow Dairy : 7½% Pref.	23/9	£1	23/6
Mellin's Food : 6% Cum. Pref.	3/9	£1	2/6
Molassine : 7% Pref. ...	10/6	15/-	10/4
Nathan (J.) : Ord.	2/1	1/-	2/-
7% Pref.	17/6	£1	16/-
8% Preferred	7/6	10/-	7/-
Nestlés : 8% Pref.	29/8	£1	30/-
Pascall (J.) : 8% Preferred	8/6	£1	8/4
Peak Frean : 5% Pref. ...	18/1	£1	18/2
8% "A" Pref.	26/11	£1	26/6
Radcliffs Edible : Ord. ...	2/-	1/-	2/-
8% Pref.	8/-	10/-	8/-
Radiation : Ord.	35	£1	36/3
6% Pref.	22/9	£1	22/6
Salt Union : Ord.	31/3	£1	31/3
7% Pref.	33/-	£1	30/6
4½% Deb.	82	£100	82¼
Schweppes : Deferred ...	32/6	£1	32/9
4% Deb.	78	£100	77
Scribbans : Ord.	14/-	£1	14/4
Deferred	1/11	1/-	2/-
Smithfield and Argentine Meat : 7½% Cum. Pref.... ...	15/3	£1	15/9
Smith's Potato Crisps : Ord.	8/6	5/-	8/6
Spiers and Pond : Ord. ...	17/6	10/-	18/6
6½% Pref.	20/3	£1	20/6
5% Deb.	95	£100	96
Spillers : Ord.	22/4	£1	22/3
6% Pref.	19/6	£1	19/3
Deferred	7/1	£1	6/9
Tate and Lyle : Ord. ...	36/6	£1	34/3
6½% Pref.	24/6	£1	23/-
Unilever : Ord.	33/9	£1	40/3
7% Preferred	23/6	£1	24/6
Union Cold Storage : 6% Pref.	20/10	£1	21/-
7% Pref.	22/6	£1	22/2
10% Pref.	27/3	£1	27/-
United Caterers : Ord. ...	8d.	5/-	7d.
United Dairies : Ord. ...	31/7	£1	32/-
6% Pref.	22/3	£1	23/-
United Glass Bottle : Ord....	20/8	£1	20/8
United Molasses : Ord. ...	16/-	£1	17/6

New Companies

NATHAN LEE, LIMITED. (252849.) To carry on the bus. of mnfrs. of and dlrs. in essences, egg products, compound lards, margarines, edible fats, etc. Nom. Cap. : £2,000 in £1 shares. Permt. gov. dir. and ch. : N. M. Lee, 18, Bankfield Road, Nab Wood, Shipley, Yorks. Qual. of above permt. gov. dir. and ch. : £500 shares. Of other dirs. : £100. Remun. of permt. gov. dir. and ch. : As fixed by the company.

RINGMER POULTRY FARMS, LIMITED. (253114.) Howells Bank Farm, Broyle Lane, Ringmer, Sussex. To carry on the bus. of poultry and egg farmers, etc. Nom. Cap. : £1,500 in £1 shares.

GREENHILL'S STORES, LIMITED. (253034.) To take over the bus. of a grocer and provision mcht. cd. on at Kineton, Warwickshire, and elsewhere as "Greenhill's Stores." Nom. Cap. : £15,000 in £1 shares. Permt. dirs. : A. Martin, Sunnycroft, Shipston-on-Stour, Worcs. ; S. T. Whitehead, Honington, Shipston-on-Stour.

STAR TEA COMPANY, LIMITED. (253184.) Mitre Square, E.C. 3. To carry on the bus. of tea mchts., grocers, etc. Nom. Cap. : £100 in £1 shares.

THOMAS CURRIE AND COMPANY (MANCHESTER), LIMITED. (253188.) 54, Swan Street, Manchester. To take over the bus. of egg mchts., etc., cd. on as "Thomas Currie and Co."

G. H. BEST AND COMPANY, LIMITED. (253160.) To take over the bus. of a wholesale grocer and importer cd. on at Scunthorpe, Lincs., as "G. H. Best and Co." Nom. Cap. : £10,000 in £1 shares (3,000 pref. and 7,000 ord.).

ABBOTTS PRESERVING COMPANY, LIMITED. (253321.) Abbotts Road, Gateshead, Durham. To carry on the bus. of fruit preservers, etc. Nom. Cap. : £100 in £1 shares. Dirs. : To be appointed by the subs. Subs. : J. H. Baldwin, Saltwell Park, Gateshead-on-Tyne; Mrs. A. M. Baldwin, Saltwell Park, Gateshead-on-Tyne.

D. FLOYD AND COMPANY, LIMITED. (253231.) 6, Castle Street, Liverpool. To carry on the bus. of mnfrs. and wholesale distributors, factors, and dlrs. of and in mnfred. goods and provisions, carriers, etc. Nom. Cap. : £1,000 in £1 shares.

BRITTLETS, LIMITED. (253290.) Alderman's House, Alderman's Walk, Bishopsgate, E.C. 2. To take over the bus. of mnfrs. of and dlrs. in biscuits cd. on as "Diserens Brothers," and the goodwill thereof and the benefit of the pending applications for the trade-marks "Brittlets" and "Brittsalts." Nom. Cap. : £2,000 in £1 shares.

S. W. N. BAXTER, LIMITED. (253272.) 386, London Road, Isleworth. To carry on the bus. of provision mchts., grocers, etc. Nom. Cap. : £100 in £1 shares.

FRUITHOF AND COMPANY, LIMITED. (253075.) 37, Cathedral House, Manchester. To take over the bus. cd. on in Manchester as "Fruithof and Co.," and to carry on the bus. of bacon factors, fruiterers, and greengrocers, etc. Nom. Cap. : £500 in £1 shares.

PIPE'S STORES, LIMITED. (253314.) 292, High Holborn, W.C. 1. To carry on the bus. of corn, flour, and cereal mchts., etc. Nom. Cap. : £100 in £1 shares.

WALTER C. HUNT (READING), LIMITED. (253226.) To take over the bus. of corn and seed mchts. cd. on by W. C. Hunt and H. Ford at Reading, Berks. Nom. Cap. : £12,000 in £1 shares.

PUTNAM AND SONS, LIMITED. (252822.) To take over the bus. of grocers and provision mchts. cd. on as "Tailby and Putnam" at Rushden, Northants, and elsewhere. Nom. Cap. : £6,000 in £1 shares (3,000 pref. and 3,000 ord.).

RADCLIFFE AND COMPANY, LIMITED. (253178.) Cross Brewery, Kidderminster. To carry on the bus. of brewers, etc. Nom. Cap. : £30,000 in £1 shares (18,000 pref. and 12,000 ord.).

CHARLES KENT, LIMITED. (253249.) 16, Fairfax Road, Chiswick, W. 4. To carry on the bus. of importers, exporters, and mnfrs. of and dlrs. in confectioneries, tea, cocoa, coffee, etc. Nom. Cap. : £100 in £1 shares.

ARTHUR TAYLOR (GRIMSBY), LIMITED. (252591.) Hutton Road, Grimsby. To carry on the bus. of fish mchts. and curers, etc., at Grimsby or elsewhere. Nom. Cap. : £500 in £1 shares.

RADIANT TABLE WATERS, LIMITED. (253219.) To acquire a freehold factory and premises at Two Mile Hill, Kingswood, Bristol, and to carry on the bus. of mnfrs. of and dlrs. in aerated and mineral water, etc. Nom. Cap. : £6,000 in £1 shares.

SPENCER AND HOWE, LIMITED. (252826.) To take over the bus. of bakers and confectioners cd. on at 23, Gordon Road, Nottingham. Nom. Cap. : £7,000 in £1 shares.

JOHN ROTHWELL, LIMITED. (253236.) The Cocoa Works, Golborne, near Warrington. To take over the bus. of cocoa and chocolate mnfrs., etc., cd. on at Golborne as "John Rothwell." Nom. Cap. : £15,000 in £1 shares.

CURRANT IMPORTERS' ASSOCIATION, LIMITED. (252776.) 19, Eastcheap, E.C. 3. To promote and protect the interests of members as importers of currants into the British Isles, etc.

W. E. JONES (ASTON), LIMITED. (252894.) The Stores, High Street, Aston, Oxford. To carry on the bus. of storekeepers, fruiterers, greengrocers, bakers, butchers, drapers, outfitters, etc. Nom. Cap. : £500 in £1 shares.

HAMES'S, LIMITED. (252751.) To take over the bus. of bakers and confectioners cd. on at 198, Princess Road, Moss Side; 135, Princess Road; 137, Brunswick Street; 77, Moss Lane West; 14, Crescent Gate, Rusholme; 306, Great Western Street; and 608, Stockport Road; all in Manchester. Nom. Cap. : £6,000 in £1 shares.

R. M. CURTIS AND COMPANY, LIMITED. (252966.) To carry on the bus. of dlrs. in spices, peppers, and seasonings of all kinds, cereals, grain, fruit, almonds, etc. Nom. Cap. : £3,000 in £1 shares.

BEECROFT AND COMPANY, LIMITED. (252798.) 24-27, Rood Lane, E.C. 3. To carry on the bus. of wholesale and retail grocers, provision mchts., and sundriesmen, etc. Nom. Cap. : £2,000 in £1 shares.

CARNARVON HOTELS, LIMITED. (252744.) 33, The Grove, Ealing, W. 5. To carry on the bus. of hotel, restaurant, and refreshment room keepers, etc. Nom. Cap. : £20,000 in £1 shares.

FARMER AND RANDALL, LIMITED. (252909.) 21, White Lion Street, E. 1. To take over the bus. of fruit importers, importers of agricultural produce, etc., cd. on at White Lion Street, E. 1, as "The Imperial Fruit Company." Nom. Cap. : £2,000 in £1 shares.

HOLE'S AND DAVIGDOR HYGIENIC DAIRIES, LIMITED. (252753.) To take over the whole of the undertaking and assets of the South of England Dairies, Ltd., and the bus. of milk contractors and purveyors now cd. on as "Hole's Hygienic Dairies, Brighton and Hove," at Brighton and elsewhere. Nom. Cap. : £125,001 in 10s. shares (140,000 "A," 110,000 "B," and 2 ord.).

H. MARKHAM COOK, LIMITED. (252925.) To take over the bus. cd. on at Grimsby as "H. Markham Cook," and to carry on the bus. of fish mchts. and curers, etc. Nom. Cap. : £5,000 in £1 shares (3,000 pref. and 2,000 ord.).

E. SIMPSON, LIMITED. (252721.) To take over the bus. of wholesale pork butchers and sausage and brawn mnfrs. cd. on at High Lane, near Stockport. Nom. Cap. : £10,000 in £1 shares.

CATTLE HIRERS, LIMITED. (253150.) Hall Ing House, Honley, Huddersfield. To carry on the bus. of horse, cattle, and sheep dlrs. and importers, farmers, meat salesmen, etc. Nom. Cap. : £500 in £1 shares.

Current Literature

Fruit and Vegetable Products

44. Utilisation of Tomato Pectin in Catsup Making. J. D. Wildman. (*Canner*, 1930, December, p. 11.)

45. Canning Qualities of Certain Peaches. C. W. Culpepper, J. S. Caldwell. *U.S. Dep. of Agric., Bull.* No. 196, 1930, October.)

46. Vitamin Value of Tomato Juice. (*Canner*, 1930, p. 37.)

47. Demonstration of Frozen Apple Products. (*Canning Age*, 1931, January, p. 41.)

48. Mould Count on 1930 Strawberries. E. L. Rhoades. (*Ibid.*, p. 53.)

49. Over-wintering of Bean Anthracrose. H. A. Hunter. (*Canner*, 1931, January, p. 13.)

50. Bacterial Spoilage of Salad Dressing. C. S. Pederson. (*Ibid.*, p. 33.)

51. Vitamin A in Plants. H. Von Euler. (*Helvetica Chim. Acta*, 1930, October, p. 1078.)

52. Pectin Chemistry. Felix Ehrlich. (*Cellulosechemie*, 1930, Vol. II., p. 140.)

53. Composition of Fruits as Used for Jam Manufacture. T. Macara. (*Analyst*, 1931, January, p. 35.)

54. An Innovation in the Manufacture of Candied Fruit. E. Jacobsen. (*Manufacturing Confectioner*, 1930, December, p. 44.)

Cereal Products

55. National Mark Malt. (*Pharm. J.*, 1930, p. 224.)

Dairy Products

56. Butter and Its Adulteration. A. D'Ambrosia. (*Giorn. di chem. ind.* Vol. 12, 1930, pp. 394-397.)

57. Decrease in Quality of Hens' Eggs during Storage as indicated by the Yolk. P. F. Sharp and C. K. Powell. (*Ind. and Eng. Chem.*, Vol. 22, 1930, p. 908.)

Analysis

58. Determination of the Milk Proteins. G. M. Moir. (*Analyst*, 1931, January, p. 2.)

59. Effect on Foods of Fumigation with Hydrogen Cyanide. Dr. G. Monier Williams. (H. M. Stationery Office, *Report on Public Health and Medical Subjects*, No. 60, Ministry of Health.)

60. Determination of Aldose Sugars by Titration with Standard Iodine Solutions. G. M. Kline and S. F. Acree. (*Ind. and Eng. Chem.*, 1930, p. 413.)

60a. Chemistry of the Products of Cocos Nucifera. J. P. C. Chasandrena. (*Biochem. J.*, 1930, p. 1493.)

61. Variation in Colour Test Value of Commercial Cod Liver Oil. F. J. Dyer and F. Wokes. (*Quart. J. Pharm.*, 1930, p. 417.)

62. Fatty Acids in the Liver of Sheep. K. Turner. (*Biochem. J.*, 1930, p. 1327.)

63. Behaviour of Natural and Artificial Fruit Essences towards Heyden Chloramine. A. Mierminster. (*Z. Unters. Lebensm.*, 1930, p. 584.)

64. Determination of Total Alkaloids in Cinchona Bark. P. A. W. Self and C. E. Corfield. (*Quart. J. Pharm.*, 1930, p. 410.)

65. Manganese in Relation to Nutrition. M. B. Richards. (*Biochem. J.*, 1930, p. 1572.)

66. Manganese in Foodstuffs. A. E. Boycott and G. R. Cameron. (*Lancet*, 1930, p. 959.)

67. Destruction of Diastatic Enzymes in Honey and Heating. H. W. Boer. (*Chem. Weekblad*, 1930, p. 646.)

68. Vitamins in Olive Oil and the Effect of Refining. G. Bertrandt. (*Compt. Rind.*, 1930, p. 725.)

69. Vitamin B_2 Content of Cereals and the Supposed Connection between Human Pellagra and Deficiency of this Vitamin. W. R. Akroyd. (*Biochem. J.*, 1930, p. 1479.)

Various

70. The Production of Almond Paste. G. Scarrone. (*Rev. de la Chocolatièrie, Confiserie, etc.*, 1930, No. 34, p. 47.)

71. Agar Takes its Place as a Food Adjunct. H. D. Mackennon. (*Food Industries*, 1930, Vol. 2, p. 123.)

72. The Status of Dates as Food. O. C. Zilisch. (*Ibid.*, Vol. 2, p. 100.)

73. Spoilage in Honey. A. G. Lockhead and L. Farrell. (*Canadian Journ. of Res.*, 1930, Vol. 3, p. 95.)

74. Dialyses of Molasses. G. Genin. (*L'Ind. Chim.*, 1930, Vol. 17, p. 542.)

75. Observations on Vitamins A and D activation by X-Ray and other Radiation. L. H. Jorstadt. (*Proc. Soc. Exper. Biol. and Med.*, 1930, Vol. 27, p. 930.)

76. Evaporating Extracts. O. Zahn. (*Chem. Fab.*, 1930, p. 285.)

77. Consumption of Canned Goods shows Increase. E. G. Montgomery. (*Food Industries*, 1931, January, p. 9.)

78. Technical Progress During 1930. (*Ibid.*, p. 11.)

79. "Dry Ice." D. H. Killefer. (*Ind. and Eng. Chem.*, 1930, p. 1087.)

80. Utilisation of Waste Coffee Products. F. W. Freise. (*Feuerfest.*, 1930, p. 150.)

Enquiries and Replies

158. *We are experimenting with a sardine paste to be produced mainly of the waste of smoked brisling and small sild. Are you aware of any formulæ of this type that have already been produced?*

159. *What is the best method of exterminating weevils and grubs in nut kernels?*

160. *Who are manufacturers of plant for the production of potato crisps?*

We understand that Messrs. G. and A. Harvey and Co., Ltd., of 58, Victoria Street, S.W. 1, have previously constructed machines of the type you require.

161. *We are interested in the packing of dried salt, pepper, and wet mustard in lead containers. Are these likely to have any action on the metal?*

In view of the fact that all lead salts are poisonous, the packing of any foodstuff in this material is likely to be dangerous. In the case of the wet mustard, if there was any vinegar present, this would result in the dissolving of some of the lead to form a poisonous compound. The same applies in a lesser degree to the salt, which, owing to its hygroscopic nature, would always be likely to absorb moisture and attack the metal. While with pepper there would not be the same risk of chemical action, there is always a risk in the package of food in lead containers that some of the metal may be rubbed off the surface and incorporated into the food.

163. *Where can pectin for jelly making be obtained?*

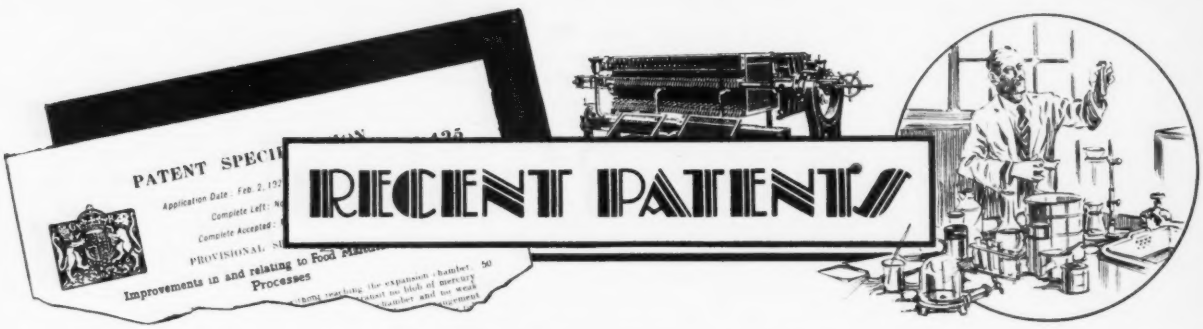
Pectin can be obtained from Messrs. H. Mayer Senior, Ltd., 52, Crutched Friars, E.C. 3, and from The Californian Fruit Growers' Exchange, Ltd., 2, Carteret Street, Westminster, S.W. 1.

166. *What is the composition of Indian curry powder?*

There are numerous recipes for curry powder, one of which is given below:

Coriander seed	...	...	5 oz.
Turmeric	...	...	5 ,,
Cardamon	...	...	40 ,,
Cayenne pepper	...	...	10 ,,
Fenugreek seed	...	...	40 ,,

Mix all together and place in a warm oven to dry, then grind very finely.



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Latest Patent Applications

57. RAUSCH, G.: Automatic dough-dividing, etc., machine. January 1.

38360. AMERICAN MACHINE AND FOUNDRY CO.: Mixing dough. December 19.

38269. CHARNLEY, T. W., and HILLARY, H. B.: Apparatus for coating sweetmeats, etc. December 19.

Specifications Published

340,265. JACKSON, J. MELLERSH (COHNITZ, E.): Making whipped cream.

340,097. DANGER, H. H. F., and DANGER, O. G. L. (trading as "Danger, H."): Machine for moulding and severing cakes and moulded articles of dough, marzipan, and like masses.

Printed copies of the full Published Specifications may be obtained from the Patent Office, 25, Southampton Buildings, London, W.C. 2., at the uniform price of 1s. each.

Abstracts Published

337,340. **Meat or fish rolls.** VICKERS, H., Barnfield, Bury New Road, Prestwich, Manchester.

In making meat or fish rolls, the usual boiled eggs are replaced by whipped egg, with which other ingredients or flavourings may be combined. The egg sets firm and can be sliced with the adjacent meat or fish. The rolls may be of cylindrical or other shape. Preferably a shell of meat or fish with a core of egg is provided. The core may be moulded to a cylindrical, etc., shape and then surrounded by minced meat or fish, or may be inserted into a hollow mould.

337,930. **Bread.** GILL, H. A., 51, Chancery Lane, London.—(Standard Brands, Inc., 19, Dover Green, Dover, Delaware, U.S.A.) October 11, 1929, No. 30954.

In making leavened bread, a small quantity of urea is mixed with the flour, yeast, and other ingredients. Less urea may be used if urease is also added to the mix; for example, to a mix containing 300 lbs. of flour 0·5 urea alone, or 0·2 to 0·25 lbs. of urea and 0·2 to 0·25 lbs. of urease, are added. The urea allows corn sugar, pure maltose, and other sugar substances to be used in the mix, in place of cane sugar, a satisfactory crust colour being obtained. To counteract the effect of the ammonia liberated by the urea on the hydrogen-ion concentration of the mix, a small amount of a relatively insoluble acid substance (mucic acid or a mixture of mucic acid and acid calcium phosphate) may be added. The urea, urease, and mucic acid may for convenience first be uniformly distributed in a filler material—*e.g.*, flour, sugar, or corn starch. A portion of the filler may be soya bean meal which will furnish urease.

337,354. **Preserving green vegetables.** BACKER, P. DE, 14, Grand Place, Menin, Belgium. July 27, 1929, No. 23130. [Class 49.]

In preserving green vegetables a harmless blue colouring agent is added to restore the green colour lost in the cooking or similar treatment. Colouring agents which may be used are methylene blue, Waterblue 6B, Patent blue, indigo-carmine, Lyons blue, and indanthrene blue.

Recent Trade Marks

This list of Trade Marks of interest to readers has been selected from the "Official Trade Marks Journal," and is published by permission of the Controller of H.M. Stationery Office.

NUTARD.—516,551. **Preparations of mustard for food.** REUBEN RICHARD SAMUEL LAWRENCE, 43, Gardner Street, Brighton, Sussex. January 7.

TONICON.—508,483. **Preparations of malt for use as food or for making beverages.** THE TONICON CO., LTD., Kingsbury House, King Street, St. James's, London, S.W. 1. January 7.

LION.—513,653. **Potato crisps packed in packets, boxes, or tins.** LIONEL MARTIN and HARRY BRADLEY, trading in co-partnership, Ashburton Road, Trafford Park, Manchester. January 7. (By Consent.)

MIAMAT.—514,401. **Tea, coffee, cocoa, and biscuits.** The firm trading as CAVALLO'S, 17, Charing Cross Road, London, W. C. 2. December 31.

BOND.—507,161. **Bread and cakes.** FRANCIS HENRY BLEWETT, Astor House, Aldwych, London, W.C. 2. December 31. (By Consent.)

SIDBRO.—518,285. **Tea.** SIDDALL BROS., Wesley Street and Manor Street, Fenton, Stoke-on-Trent. December 31.

SOYOLAIT.—517,663. **Flour and preparation, for use as food or as ingredients in food, all prepared from soya beans.** THE SOYA FLOUR MANUFACTURING CO., LTD., 7, Mincing Lane, London, E.C. 3. December 31. (Associated.)

NEOBOVININE 20.—517,833. **Meat juices prepared by cold process.** THE BOVININE CO., 536, Lake Shore Drive, Chicago, Illinois, U.S.A. December 31. (Associated.)

BLUE SKY.—517,347. **Condensed milk.** LEON MOOCHNIK, trading as "J. C. Ratner and Co.," 146, Bishopsgate, London, E.C. 2. December 24.

WEATEX.—516,266. **Ground bread for use as sausage bindings.** STOKES AND DALTON, LTD., Victoria Spice Mills, Victoria Road, Leeds. December 17. (By Consent.)

TWINKLERS.—516,690. **Tinned fish.** BRANDAO GOMES Y CA., Limitada, Espinho, near Oporto, Portugal. December 17.

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